

Isolation of *Serratia plymuthica* from a Human Burn Site

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The saprophytic bacterium *Serratia plymuthica* was recovered from a facial wound (burn) site of a pediatric patient. The clinical significance of the organism was undetermined due to its apparent eradication from this location by therapy with topical 1% silver sulfadiazine. Seeding of the burn with *S. plymuthica* may have occurred from contaminated moisture sometimes found on and around steam radiators.

The taxonomy of the genus *Serratia* has undergone considerable change over the past few years, with seven species now recognized (2). Whereas many of the previously published studies on *Serratia* infections have focused primarily on the major nosocomial pathogen *S. marcescens* (4), recent reports have dealt with the recovery of three environmental species, *S. ficaria*, *S. rubidaea*, and *S. plymuthica*, from clinical specimens taken from wounds (*S. ficaria* and *S. rubidaea*) and upper-respiratory-tract secretions (*S. ficaria* and *S. plymuthica*) (2-4, 7). Since the frequency of recovery of these saprophytic species from clinical material is unknown, the medical as well as epidemiological significance is obscure. In this report, we describe the recovery of *S. plymuthica* from the burn site of a pediatric patient.

An 8-month-old male fell against a steam radiator in his house and received a third-degree burn over a portion of his face measuring 5.5 by 6 in. (14 by 15 cm). He arrived at the emergency room afebrile, but with a raw open wound complicated by facial edema. A surveillance culture was taken from the wound, and the culture revealed *S. plymuthica* (API 1207763) as the predominant microorganism along with *Staphylococcus epidermidis* and group B streptococci. Subsequently, 1% silver sulfadiazine cream was topically applied to the burn site three times daily for 2 weeks. A blood culture drawn to rule out potential sepsis was negative. In two stool cultures for watery diarrhea, only *Escherichia coli* and *Klebsiella* sp. were revealed. A repeat surveillance culture of the burn site 2 days after initiation of topical silver sulfadiazine therapy showed only *Staphylococcus aureus*. The wound subsequently healed with no evidence of infection.

Serratia plymuthica was recovered from the burn site on both blood and MacConkey agar incubated overnight at 37°C. The organism was resistant to cephalothin, but sensitive to amikacin, ampicillin, carbenicillin, cefamandole, cefotaxime, ceftioxin, chloramphenicol, gentamicin, sulfisoxazole, tobramycin, trimethoprim-sulfamethoxazole, moxalactam, and piperacillin as determined by disk diffusion (1). Conventional biochemical tests (5) confirmed the identity of the organism as *S. plymuthica*. The organism produced an alkaline-acid slant when inoculated onto Kilger's iron agar without the evolution of gas or the formation of hydrogen sulfide. In addition, positive reactions for *S. plymuthica* were recorded in the following tests: production of DNase and chitinase, use of citrate, growth at 4°C and in the presence of 0.2% acetate, nitrate reduction, acetylmeth-

ylcarbinol formation, and motility. The organism fermented dextrose, maltose, sucrose, mannitol, raffinose, arabinose, xylose, lactose, salicin, sorbitol, and trehalose, but failed to use adonitol, dulcitol, or rhamnose (Table 1).

This case report describes the first known isolation of *S. plymuthica* from a human wound site and indicates that this normally saprophytic organism may indeed be recovered from clinical material. Whenever possible, all arabinose-positive *Serratia* species (non-*S. marcescens*) isolated from human specimens should be identified to species level to more fully delineate the epidemiology of these newly designated saprophytic *Serratia* species (*S. plymuthica*, *S. rubidaea*, and *S. ficaria*). The API 20E identification system is fully capable of distinguishing *S. plymuthica* from the phenotypically related *S. liquefaciens* (4) without the necessity of supplementary biochemical tests. However, additional biochemical tests are required when identifying *S. ficaria* by other miniaturized systems (3, 8).

The clinical significance of the *S. plymuthica* recovered from the burn site was undetermined due to the apparent eradication of the organism by topical treatment with 1% silver sulfadiazine (the organism was susceptible to sulfisoxazole). To date, *S. plymuthica* has not been associated with a human infection. The environmental source of the *S.*

TABLE 1. Tests distinguishing *S. plymuthica* from other biochemically similar *Serratia* spp.^a

Test	Patient's isolate	<i>S. plymuthica</i>	<i>S. liquefaciens</i>	<i>S. ficaria</i>
Lysine decarboxylase	-	-	+	-
Ornithine decarboxylase	-	-	+	-
Growth in 8.5% NaCl	-	-	V	NK
Growth at 4°C	+	+	+	+
Chitinase	+	+	V	+
Fermentation of:				
Adonitol	-	-	-	(+)
Arabinose	+	+	+	+
Dulcitol	-	-	-	-
Rhamnose	-	-	-	+
Sorbitol	+	V	+	+

^a Compiled from references 3, 5, and 6. +, Positive reaction; -, negative reaction; V, variable reaction; NK, not known; (+), delayed reaction.

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plymuthica in this case is unknown, although it is tempting to speculate that the excess moisture normally found on and around steam radiators was contaminated with the organism. Contact of the face of the patient with the contaminated water could have seeded the burn with *S. plymuthica*; however, other possible sites of contamination cannot be ruled out since this organism has also been recovered from soil, plants, and milk (4, 5). Further studies are required to determine the true clinical significance of *S. plymuthica* recovered from clinical specimens.

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