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Short Communication

OCCURRENCE OF ENTEROCOCCUS SPECIES IN ANIMAL PRODUCTS AND ENVIRONMENT

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SUMMARY

Enterococcus species were detected in all the 49 samples comprising of chicken meat (10), chevon (4), fish (12), raw milk (4), sewage (6) and excreta (13) with frequent isolation of more than one species from individual samples. *Enterococcus faecalis* (79.6%) constituted the major species detected in all kinds of samples, followed by *E. raffinosus* (28.6%), *E. gallinarum* (16.3%), *E. pseudoavium* (14.3%) and *E. solitarius* (14.3%). *E. raffinosus* could be isolated from chevon, fish, sewage and pig excreta only. *E. gallinarum* was detected in chicken, chevon and sewage, *E. pseudoavium* in chicken, chevon and fish while *E. solitarius* was isolated from the specimens of chicken, fish, raw milk and pig excreta. The results confirmed ubiquitous nature of the microorganism.

Key words: *Enterococcus*, enterococci, milk, meat, fish, sewage

Evaluation of microbiological quality of animal products is of utmost importance for the safety of human health. Besides the specific pathogenic microorganisms that present an immediate risk to public health, growing attention is now being paid to several other microorganisms associated with foods or food-producing animals that may have adverse impact on the consumers' health. Species of the genus *Enterococcus* form part of the normal flora of the gastrointestinal tract of both human beings and animals and are widely distributed in nature. These are commonly encountered in soil, water, vegetation and foods (Giraffa *et al.*, 1997). Traditionally, enterococci have been considered harmless commensals but these have also been documented as significant etiological agents of urinary tract infections, bacteremia, endocarditis, and other ailments in human beings (Morrison *et al.*, 1997, Khanal *et al.*, 1998, Sherer *et. al.*, 2005). Enterococci have emerged as the third leading cause of nosocomial infections in the hospitals, as a result, these are now considered important emerging pathogens (Low *et al.*, 1994, Willems *et al.*, 2005).

In view of the growing public health significance and changed taxonomy of enterococci (Holt *et al.*, 1994), the present investigations were carried out to study the occurrence of different species of *Enterococcus* in animal products and the environment. Forty-nine samples comprising of raw milk (4), chicken meat (10), chevon (4), fish (12), sewage (6) and faecal matter of pigs (10), buffalo (1) and man (2) from different sources were processed for isolation of enterococci by inoculating on m-Enterococcus agar medium (Slanetz and Bartley, 1957) and incubation at 37°C for 48 h. Red, maroon or pink colonies were considered as presumptive enterococci. Representative colonies (2-5) from different morphological groups from each plate were picked up and were examined for morphological, cultural and biochemical characters and were classified according to the Bergey's Manual of Determinative Bacteriology (Holt *et al.*, 1994).

Enterococcus spp. were detected in all the samples under study. *Enterococcus faecalis* (79.6%) was the most frequently encountered species, followed by *E. raffinosus* (28.6%), *E. gallinarum* (16.3%), *E. pseudoavium* (14.3%) and *E. solitarius* (14.3%). Source wise distribution of these isolates has been shown in Table 1. Similar observations revealing ubiquitous presence of enterococci have been reported earlier (Giraffa *et al.*, 1997, Klein *et al.*, 1998, Chingwaru *et al.*, 2003).

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Table 1

Occurrence of *Enterococcus sp.* in animal products and environmental specimens

Source	No. of samples	No. of positive samples for *Enterococcus* sp.				
		E. faecalis	*E. gallinarum*	*E. pseudoavium*	*E. raffinosus*	*E. solitarius*
Animal Products						
Chicken meat	10	10	2	3	0	1
Chevon	4	3	2	2	2	0
Fish	12	6	0	2	4	4
Raw milk	4	4	0	0	0	1
Total	30	23 (76.7)	4 (13.3)	7 (23.3)	6 (20)	6 (20)
Environmental Specimens						
Sewage	6	5	4	0	3	0
Pig excreta	10	8	0	0	5	1
Buffalo excreta	1	1	0	0	0	0
Human excreta	2	2	0	0	0	0
Total	19	16 (84.2)	4 (21.1)	0	8 (42.1)	1 (5.3)
Grand Total	49	39 (79.6)	8 (16.3)	7 (14.3)	14 (28.6)	7 (14.3)

Figures in parentheses indicate percentage

The present study revealed the occurrence of several species of *Enterococcus* in the food products and environment in this region. Widespread prevalence of enterococci bears great importance in the changed scenario because their control often proves challenging due to their ability to adapt to the adverse environmental conditions and the proliferation of drug-resistant strains in animals posing serious threat to human beings via food chain (Chingwaru *et al.*, 2003).

Approximately 85 to 90% enterococcal infections are attributed to *E. faecalis* and 5 to 10% to *E. faecium*, other species such as *E. avium, E. casseliflavus, E. durans, E. gallinarum* and *E. raffinosus* have also warranted attention due to their occasional implication in human infection (Simjee *et al.*, 2000, Sherer *et al.*, 2005, Willems *et al.*, 2005). The predominance of *E. faecalis* in causing infections might be due to its higher prevalence in comparison to other species. The safety aspect of food associated enterococci, thus, needs to be thoroughly examined.

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