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6- SUMMARY

In the present study, 358 faecal samples (230 cow calves and 128 buffalo calves) were collected from animals and subjected to bacteriological examination for the presence of *Yersinia enterocolitica*. The overall prevalence of *Yersinia enterocolitica* was 9.78 %.

Yersinia enterocolitica could be isolated from buffalo calves in a higher rate than cow calves (10.93 % Vs 9.13 %). The organisms could be isolated from apparently healthy and diarrhoeic calves in an incidence of 3.33 Vs 12.86 % and 8.57 % Vs 13.79 % in cow and buffalo calves, respectively.

The percentage of isolation by direct plating was (57.14 %) while that of cold enrichment followed by plating on CIN agar was (82.85 %).

The biotyping of the isolated *Yersinia enterocolitica* revealed that 19 out of 35 isolates (54.29 %) belonged to *Yersinia enterocolitica* biovar 1A, 9 isolates (25.71 %) to biovar 1B and 7 isolates (20.00 %) to biovar 2.

Yersinia enterocolitica isolates were serotyped into four different serovars. Most isolates 16/35 (45.71 %) belonged to serovar O:8, while 7 isolates (20.00 %) belonged to O:3 and O:9 each and the remainders 5/35 (14.28 %) belonged to serovar O:3 .

The correlation between serovars and biovars of *Yersinia enterocolitica* isolated from examined calves revealed that 5 serobiovars were obtained. The most common serobiovar was O:8/1B (9 isolates; 25.71 %), followed by serobiovar O:5/1A, O:8/1A and O:9/2 (7 isolates each; 20.00 %) and the lowest serobiovar was O:3/1A with an incidence of 14.29 % .

From 35 tested *Yersinia enterocolitica* isolates belonged to 5 serobiovars, 28 isolates with an incidence of 80.00 % were positive for Congo red test and able to survive in normal calf serum. Twenty six isolates with an incidence of 74.29 % were able to bind with crystal violet, as well as 34 and 32 isolates were haemagglutination positive using bovine and guinea pig RBCs. with an incidence of 97.10% and 91.43 , respectively.

Twenty isolates with an incidence of 57.14 % were positive for autoagglutination, pyrazinamidase production and calcium dependency tests, while 24 isolates with an incidence of 68.57 % were able to grow in normal calf serum.

Concerning HEp-2 cells invasion, enterotoxin production and Sereny test, 31, 23 and 16 isolates gave positive results with incidence of 88.57 %, 56.71 % and 45.71 , respectively.

The LPS analysis of five *Yersinia enterocolitica* serobiovars by SDS-PAGE analysis showed that *Yersinia enterocolitica* LPS contained about four bands after staining with silver nitrate method which ranged from 11.485 kDa to 17.309 kDa.

The OMPs analysis of five *Yersinia enterocolitica* by SDS-PAGE analysis showed that *Yersinia enterocolitica* OMPs contained about five bands after staining with silver nitrate method which ranged from 33.981 kDa to 71.342 kDa.

The use of indirect ELISA using whole bacterium and LPS antigens revealed that 10.63 % and 8.75 % of serum samples from apparently healthy calves were seropositive to *Yersinia enterocolitica* antibodies, respectively, while 26.77 % and 27.78% serum samples from diarrhoeic calves were seropositive. On the other hand, 6.25 % and 17.7 % serum samples collected from apparently healthy and diarrhoeic calves were seropositive, respectively, by using OMP as coating antigen in indirect ELISA.

In the present study sensitivity and specificity of ELISA using WB, LPS and OMPs extracted from *Yersinia enterocolitica* serobiovars were studied. The sensitivity of WB antigen, LPS antigen and OMPs antigen in detection of *Yersinia enterocolitica* antibodies was 91.43 %, 91.43 % and 97.14 %, respectively. Outer membrane proteins (OMPs) ELISA gave the highest specificity (96.59 %), followed by lipopolysaccharide (LPS) ELISA (88.54 %) and whole bacterium (WB) ELISA (88.24 %).

Strong cross-reactions were observed between *Yersinia enterocolitica* O:9 and *Brucella abortus* using WB-ELISA. These results validated the use of OMPs-ELISA as a suitable assay to differentiate clearly between *Brucella abortus* infections.