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Studies on Brucellosis in sheep and goats

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LIST OF ABBREVIATIONS

AHRI	Animal Health Research Institute
AMOS	*Brucella* species : Abortus, Melitensis, Ovis and Suis
AOAD	African organization for agriculture development
BAPAT	Buffered Acidified Plate Antigen test
Bp	Base pair
Br.	*Brucella*
Br.abortus	*Brucella abortus*
Br.melitensis	*Brucella melitensis*
Brucella spp.	*Brucella* species
cELISA	Competitive ELISA
CFSPH	The center for food security and public health
CFT	Complement fixation test
CFU	Colony forming unit
CO_2	Carbon dioxide.
DNA	Deoxyribonucleic acid
DPR	differential positively rates
ELISA	Enzyme linked immunosorbent assay
FAO	Food and Agriculture Organization
GOVS	General organization for veterinary services
H_2S	Hydrogen sulphide.
ICA/ ICT	Immunochromatographic Assay, Immunochromatographic test
ICFTU ml	International Complement Fixation Test Univ. per ml of serum samples

I-ELISA	Indirect Enzyme-linked immunosorbent assay
IgA	Immunoglobulin class A
IgG	Immunoglobulin class G.
IgG1	Immunoglobulin class G1
IgM	Immunoglobulin class M
ISAbS	International Society For Applied Biological Sciences
IU	International Unit
LFA	Lateral Flow Assay
2-ME	2-Mercapto Ethanol
Mg	Milligram
Ml	Milliliter
mRBT	modified Rose Bengal Test
No.	Number.
NVSL	National veterinary services laboratories
PBS	Phosphate-buffered saline
PCR	Polymerase Chain Reaction
QACs	Quaternary ammonium compounds
RBPT	Rose Bengal Plate test
RIV.T	Rivanol test
TAT/ SAT	Tube Agglutination test, standard agglutination test
USDA	United State Department of Agriculture
WHO	World Health Organization
µl	Microliter
/	Per
>	Greater than
≥	Greater than or equal
<	Less than
≤	Less than or equal

CONCLUSION

From the results of the present study, it is concluded that.

1) The buffered acidified plate antigen test is an effective test for initial screening of brucellosis in farm animals as it is more sensitive for detecting brucella infected animals than rose bengal plate test. Beside that, it is simple easy, quick and inexpensive test.

2) No single serological test could be identify all brucellosis infected animals, Complement Fixation test is still the superior one among the empolyed tests as it gave the highest balance of sensitivity and specificity.

3) PCR assay could be recommended as a confirmatory method and an alternative to culture for diagnosis of brucellosis as its speed, safety, high sensitivity, specificity and saving cost and time where the results could be obtained within less than 3 hours.

4) The isolation and biotyping of *Br. melitensis* particularly biovar 3, the most pathogenic strain and the main cause of brucellosis in some animal species among El-Sharkia governorate, is a very dangerous alarm and gives spot light for application of preventive hygienic measures and control program of brucella not only in El-Sharkia governorate but in all Egypt.

5) Special direction toward sheep and goats for control and vaccination of these species against brucellosis as these species represent the main host for *Br. melitensis* which proved to be among all animals.

SUMMARY

- The present study was carried out on 837 animals (626 sheep and 211 goats) from different localities of Sharkia governorate to study the prevalence of brucellosis, diagnosis of brucellosis by using different serological techniques including (BAPAT, RBPT and CFT) and evaluate these techniques, Apply trials of isolation, identification and typing of *Brucella* spp. from seropositive animals and characterize the *Brucella* spp. which isolated from seropositive animals using polymerase chain reaction (PCR) .
- All blood samples are tested by BAPAT and RBPT as screening tests and confirmed by CFT.
- Serological examination of 837 blood samples under investigation by the application of :-

  A- BAPAT: revealed that total percentage of positive reactors was 14/626 total sheep samples (2.2 %) and 11/211 total goat samples (5.2%).

  B- RBPT: revealed that total percentage of positive reactors was 10/626 total sheep samples (1.6%) in sheep and 10/211 total goat serum samples (4.7%).

  C- CFT: revealed that total percentage of positive reactors was 12/626 total sheep samples (1.9%) in sheep and 9/211 total goat serum samples (4.3%).
- Sensitivity and specificity of BAPAT with CFT was 100% and 99.5% respectively, While RBPT was 90.5% and 99.8% respectively.

- The agreement among BAPAT and RBPT by using CFT as gold standard test on 626 and 211 sheep and goats sera by using Cohen's Kappa statistics showed that there were a very good correlation between negative and positive results of (BAPAT and CFT) and (RBPT and CFT) where the agreement was (0.93) among sheep. And there were a very good correlation between negative and positive results of BAPAT and CFT where the agreement was (0.89) and RBPT and CFT where the agreement was (0.94) among goats

- From previous mentioned results it is shown that CFT has high sensitivity, specificity due to its avoidance of false results and cross reaction with other gram negative bacteria which has smooth antigen similar to *Brucella*. As it detect only IgG1 specific to *Brucella*. The RBPT has lower sensitivity and specificity than CFT. This may be due to the presence of some samples which reacted positively to the RBPT which proved negative by CFT as a specific test for diagnosis of brucellosis.

The results of studying some risk factors related to brucellosis showed that:-

- Percentage of *Brucella* reactors among sheep from Menea El-Qamh, Zagazig, Belbais, Abu_Kabir and Dyarb Negm were 4.1%, 1.5%, 0.0%, 1.7%, and 1.7% by using CFT respectively.

- Percentage of *Brucella* reactors among goats from Menea El-Qamh, Zagazig, Belbais, Abu_Kabir and Dyarb Negm were 3.8%, 5.7%, 0.0%, 3.9% and 9.5% by using CFT respectively.

- Percentage of *Brucella* reactors at age 2-5 years (2.5% and 5.7%), at age 1-2 years (1.4% and 3.8%) and at age <1 year (0.8% and 1.8%) among sheep and goats respectively using CFT.

- Percentage of *Brucella* reactors among ewes (2.7%, 1.9% and 2.3%) was higher than rams (0.7%) using BAPAT, RBPT and CFT respectively. While the percentage of *Brucella* reactors among bucks (6.5%, 6.5% and 3.3%) was higher than does (4.6%, 4% and 4.7%) using BAPAT, RBPT and CFT respectively.
- Bacteriological examination and identification revealed (6) isolates were obtained from (23) samples collected tissues from seropositive slaughtered sheep. While in goat (11) isolates were obtained from (24) samples collected tissues. All isolates identified as *Brucella melitensis* biovar (3).
- Application of PCR test for rapid identification of *Brucella* species isolated from lymph nodes and aborted foeti of (5) naturally infected slaughtered animals (3 sheep and 2 goats) revealed that five isolates of molecular size of 731 bp identified as *Br. melitensis*.