

## Short Communication



## The Prevalence of Brucellosis in Kundhi Buffaloes in District Hyderabad, Pakistan

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**Abstract** | Bovine brucellosis causes heavy losses in dairy animals. The current study was conducted to observe the prevalence of brucellosis in district Hyderabad, Pakistan. A total of Four hundred and Two (n=402) milk samples were collected from 30 towns during winter and summer seasons of 2014-2015 from Kundhi buffaloes. In winter, milk specimens (n=124) were collected from 12 towns and in summer (n=278) from 18 towns arbitrarily. All samples were investigated for *Brucella abortus* (*B. abortus*) antibodies using by milk ring test (MRT). An overall 1.99 percent (8/402) positive prevalence of *B. abortus* antibodies was detected in milk of Kundhi buffalo. From 124 milk samples collected throughout winter only 3 (2.41%) were found positive while, among 278 milk samples taken throughout summer, 5 (1.79%) were declared as positive. It was concluded that prevalence of brucellosis in Kundhi buffaloes was low in Hyderabad, Pakistan.

**Keywords** | Brucellosis, Kundhi Buffalo, Winter, Summer, Milk Ring Test, Hyderabad

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It has been estimated that more than 95% world population of buffaloes are found in Asia mainly in India, Bangladesh, Pakistan, Nepal, Thailand and Sri Lanka (Othman et al., 2014). Buffalo is considered as the foremost milk producing animals of Pakistan which is known as “black gold”. They also have a significant role in draught and meat production. In Pakistan, three breeds of buffalo viz., Nili Ravi, Kundhi and Azi-Kheli are found. Kundhi buffaloes is found throughout the Sindh province mainly on both sides of the Indus River, with average milk production of 1700-2200 liters per lactation (Kumar et al., 2013; Mirza et al., 2015).

The Buffalo is facing several health issues, including colibacillosis and brucellosis (Mailk et al., 2013). Brucellosis is also called Bang disease, which is a zoonotic disease throughout the world (Durrani et al, 2015), that is a common transmittable bacterial disease of livestock and have great economic importance worldwide including Pakistan

(Munir et al., 2010). Brucellosis is caused by an aerobic gram-negative bacteria of the genus *Brucella*. Among the genus, *Brucella abortus* and *Brucella melitensis* are the principal cause of brucellosis in farm animals (Karaca et al., 2007). *Brucella* organism is also declared as a primary agent of brucellosis in human beings, which is transmitted to humans from infected/carrier animals including cattle, goat, sheep and dogs through ingestion of contaminated animal products and/or by inhalation of air borne pathogen (Buhari et al, 2015). Subclinical infections in animals often results in reduced milk production and clinical cases had abortion (Cutler et al., 2005).

In Hyderabad, Kundhi buffalo is a major milch animal, and kept as in large-scale and small-scale farms. Hyderabad region is also a border city, where from animals cross from other cities (i.e., Karachi, Jamshoro, Tando Muhammad Khan etc.) without proper quarantine measures, thus, several transmissible diseases including Anthrax, Tuber-

culosis and brucellosis are present in this region (Soomro et al., 2014). Therefore, in present study, it was planned to observe the prevalence of brucellosis in Kundhi buffaloes of district Hyderabad, Sindh, Pakistan.

In this study, milk samples (n= 402) were collected from Kundhi buffalos in district Hyderabad to analyze the *Brucella abortus* (*B. abortus*) antibodies during winter and summer seasons of year 2014-2015. These samples were collected from milking animals regardless of animal age, of both large and small scale farming systems. In winter, milk samples (n=124) from 12 towns and in summer (n=278) from 18 towns were collected randomly. During sample collection, hygienic conditions were ensured by applying an appropriate antiseptic solution on clean teats. The first few strips of milk were discarded and then a 5 mL milk sample was collected in sterilized glass bottles. These samples were cooled immediately in ice and transported to laboratory in ice jar, where they were stored at -20°C for as described by Soomro et al. (2014).

All the samples were analyzed using Milk ring test (MRT) according to standard technique (OIE, 2008). Hematoxylin stained antigen of *B. abortus* (Strain-99) was obtained from Central Veterinary Diagnostic Laboratory Tandojam (CVDL Tandojam, Pakistan) and used for MRT as recommended by manufacturer (Veterinary Research Institute, Lahore, Pakistan). In brief, 0.03 µL of *B. abortus* antigen was added to 1000 µL of milk, shaken well and incubated at 98.6 °F for 60 minutes and then tested for ring formation.

All results were computed using Microsoft Excel spreadsheets and were presented in percentages (by dividing the number of +ve samples with total number of samples x 100).

MRT is recognized as a key screening test for brucellosis in milk (Soomro et al., 2014). A total 124 milk samples were collected throughout winter, 3 (2.41%) were found positive for *B. abortus* antibodies, whereas 121 (97.59%) were declared as negative by MRT. Likewise, 278 milk samples collected throughout summer, 5 (1.79%) were regarded as positive while remaining 273 (98.20%) were found negative for *B. abortus* antibodies. An overall 1.99 percent (8/402) positive prevalence of *B. abortus* antibodies in milk of Kundhi buffalo was found (Table 1).

**Table 1:** Prevalence of *Brucella abortus* in Kundhi Buffaloes in Distract Hyderabad

| Season | No. of towns | No. of milk samples | Positive No. (%) | Negative No. (%) |
|--------|--------------|---------------------|------------------|------------------|
| Winter | 12           | 124                 | 3 (2.41%)        | 121 (97.59%)     |
| Summer | 18           | 278                 | 5 (1.79%)        | 273 (98.20%)     |
| Total  | 30           | 402                 | 8 (1.99%)        | 394 (98%)        |

According to OIE, brucellosis is a second most global zoonotic disease that chiefly found in the South Asia, India and Pakistan (Add reference). It affects the buffalo, cattle, sheep, goat and swine. In cattle, disease is mainly caused by *B. abortus*. The disease is important from commercial point of view because it is a major barrier for trade and one of the utmost overwhelming transboundary animal disease (OIE, 2008). In our present study, a very little prevalence (1.99%) of *B. abortus* was observed as compared to other studies. Like, a previous study conducted in Hyderabad indicated the 47.19% prevalence of *B. abortus* in buffaloes (Soomro et al., 2014), however the number of samples analyzed in the previous study were very little (n=89) as compared to our study. Similarly, another survey done in Karachi indicated the 14.00% prevalence of *B. abortus* antibodies in the milk of bovine population (Durrani et al., 2015). These results of high prevalence (14 to 47.19%) recorded previously might be due to the breed differences as our study was only on Kundhi buffaloes, however other researchers have study on mixed breed of buffaloes and cattle. Because, inter-breed differences for susceptibility to *B. abortus* in bovines have been reported recently (Mangi et al., 2015). The study reported significant differences between five different cattle breeds for susceptibility levels to *B. abortus* using the different techniques including Rose Bengal plate test (RBPT), serum agglutination test (SAT) and Competitive Enzyme Linked Immunosorbent Assay (c-ELISA). The study declared the difference of *Brucella* antibodies from 8.8% to 36.67% in different cattle breeds. However, our present study results are in agreement with a recent report that declared the prevalence of *B. abortus* antibodies in bovine population of Iran as 1.18% analyzed through MRT (Maadi et al., 2011).

In present study, we have find a very little difference in prevalence of *B. abortus* in buffaloes during different seasons. This result is in consistent with a recent study that also reported a non-significant ( $P < 0.05$ ) effects of season on *B. abortus* antibodies in bovines (Maadi et al., 2011). However, another study dealing with elk indicated that milder winters could reduce the sero-prevalence of brucellosis in the elk populations (Cross et al., 2007). These dissimilarities in sero-prevalence of bovine brucellosis might be due to geographical differences, technique applied, sample used and/or variation in the animal species used in these studies (Sachan et al., 2013).

From present results, it could was concluded that prevalence of brucellosis in Kundhi buffaloes in Hyderabad region of Pakistan is very low; however, there is still a threat present to human population and other livestock species. Therefore, further studies should be carried out for the effective strategies for rational control and prevention of brucellosis in buffalo breeds and other farm animals.

## CONFLICT OF INTEREST

There is no conflict of interest in the article.

## AUTHORS' CONTRIBUTION

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Mr Adnan Yousaf was main author of the research work carried out. Dr Riaz Ahmed Laghari was supervisor, Muhammad Shoaib helped in correspondence, Abrar Ahmad, Kanwar Kumar Malhi assisted in results analysis, Dr. Gul-fam Ali Mughal was advisor in treatment line, Shakeel Lakhho and Imam Bakhsh Khetran were fellow in the research work and proposal making.

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