# Mesopotamian Buffaloes: Endangered Genetic Resource, Review

Jabbar Khliaf Mukssar Alsaedy[1,*] and Khalid Al-Fartosi[2]

[1]*Ministry of Agriculture, Iraqi Delegate in IBF, Iraqi*

[2]*College of Science, University of Thi-Qar, Iraqi delegate in IBF, Iraqi*

**Abstract:** The water buffalo of Iraq are river type *(Bubalus bubalis*), some scholars think they are most closely related to the water buffalo of India, but white patches which is rather common on the foreheads indicate some influence of Nile breed, this latter influence of course could be quite recent (ALhamadany, 2015), while recent molecular studies referred indicated that Mesopotamian buffaloes were from River type and large animal as well well very large variation between animals and buffalo populations due to absent of genetic improvement (Jaayid and Hamd). There were many historical and archeological studies that had different debate about Mesopotamian buffalo origin still need more molecular genetic studies [1].

Buffalo breeders (Maadan), in Iraq represents living descendants of the ancient Sumerians, divided to Nomads and Villagers [2]. These ancient genetic recourses in Iraq, go through many drastic impacts during three decades, environmental, economical and wars, lead to decline of population and breeders displacement [3], that need conservation plans to be adopted and protect this ancient animal, which achieved by Ministry of Agriculture. Baghdad, involved Artificial Insemination project, sponsored by FAO and supported breeders by loans.

**Keyswords:** Mesopotamian buffaloes, Maadan, Marsh drought.

## HISTORICAL ASPECTS

In Prehistoric times before writing, wild buffaloes may have lived in Mesopotamia while in the pre-Christian centuries there may been movements of domestic animals from »the Indus Valley.

Cylindrucal seal impression was found below the Royal Cemetery of Ur, clearly depicting two male swamp buffaloes being watered by attendants (Zeuner, 1963) [4], kept in Louvre, museum (Figure **1**).

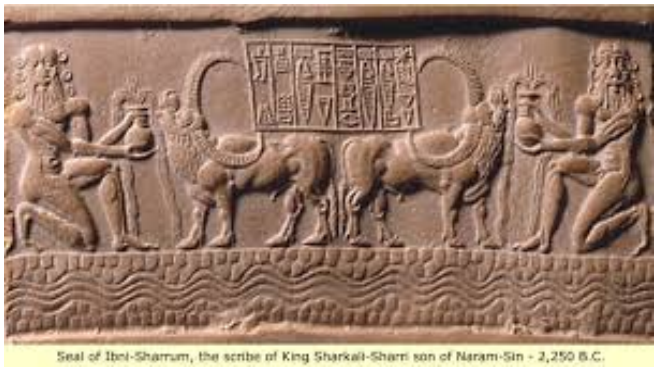


**Figure 1:** Cylinder Seal of Shar-Kali –Sharri, King of Akkad, Mesopotamia, C.2340-2100 B.C (Black Marled collection, Louvre, Paris, France 326).

Many archeological and historical theories about Mesopotamian buffaloes need more molecular genetic studies to ascertain that buffalo in Iraq native in nature or imported [1].

## BREEDS

Mesopotamian marshlands in southern parts of Iraq, ancient homer tract of Mesopotamian buffaloes, one of the largest centers of buffalo concentration in Iraq, up to 60% of buffalo herd (MOA, 2008 NATIONAL CENSUS). Buffalo in Iraq shows some range both in size and color, there is no reason to classify them to a distinct breed, and variations in appearance between the buffaloes in the marshes and other parts of the country were probably due to different feeding and management [5].

No records have been found of buffalo introductions to Iraq for centuries until First World War and Saddam régime Era, when buffalo brought from India to improve milk production in Mesopotamia, the latter herd were all slaughtered due to H.S (Hemorrhagic Septicemia disease) [3, 6].

Karyotype studies revealed that most of buffalo populations in Iraq, were from Riverine (2n=50) chromosome [7]. According to climate conditions Iraqi buffaloes, may be divided to three main ecotype populations: 1) Marsh ecotype (highest population density distributed mainly in Mesopotamian marshlands in three province (Thi-Qar, Missan and Basrah provinces) in southern parts of country. 2) Euphrates ecotype habitat at Euphrates river bank in central parts of Iraq (Babylon, Najaaf and Al- Qadisiyah provinces). 3) North ecotype in hilly region (Nineveh and Kirkuk provinces) [8].

The first study of genetic diversity of buffalo in Iraq, revealed that Mesopotamian buffaloes have high levels

*Address correspondence to this author at the Ministry of Agriculture, Iraqi delegate in IBF, Iraqi; Tel: 09647506914031;
E-mail: alsaedyjabbarkh@gmail.com

ISSN: 1927-5196 / E-ISSN: 1927-520X/17 

of genetic differentiation and genetic structure with three major clusters could divided to three main clusters, the first one included Baghdad the capital, Basra and Al-Qadisiyah while the second cluster consist of Kirkuk and Missan, while third cluster consisted of Babylon and Mosul in the North [9].

Buffalo raising mainly for milk production, secondary for meat and no work purpose [10]. M'adaan the buffalo breeders in Iraq can be divided into nomads which following free raising management, their large scale herds needs of reed and papyrus as fodder for their animals, they have seasonal movements but the villagers settled in colonies with small scale breeders [11].

Most of buffalo breeders in Iraq have low level education or without, and the largest of them haven't land of their own, for agricultural use. They selected their bulls based on reputations of milk production, fertility and milk fat, have no milking machine neither production records, no artificial insemination, only natural mating, hand. Common methods of cooling especially in long hot seasons in Iraq were wallowing in marshes in southern parts of country while spraying or swimming in rivers and ponds in other parts of Iraq. Majority of buffalo breeders in Iraq depend on their financial status to continue management costs without obtain loans from governments (Ministry of agriculture survey, 2017).

## THREATS

### Drought of Marshlands

Before 2003, systematic drought by Saddam regime lead to severe decline of buffalo population in Iraq with huge mass displacement of Maadan, true buffalo breeders and drought of marshlands [3]. Drought and water withdrawals are again desiccating the marshes, and pollution of water, air, and land is extremely severe, maadan displacement as well feeding shortage with endemic disease lead to high rate buffalo mortality and Marsh Arabs buffalo breeders in Iraq suggested "environmental refugees as "for the main reason for their flight had been the drying of the marshes [12, 13].

## ENDEMIC DISEASES

Tables bellow related with endemic diseases in Mesopotamian buffalo.

There were three common diseases in buffalo breeding in Iraq.

Foot and mouth disease.Hemorrhagic septicemia.

Brucellosis.

All tables Data from Vet Directorate Ministry of Agriculture, 2011.

**Table 1: FMD in Mesopotamian Buffalo from 2011-2015**

| Province | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| Ninawa | 333 | 0 | 15 | 1 | 0 |
| Kirkuk | 124 | 0 | 0 | 0 | 0 |
| Salah El-din | 105 | 0 | 0 | 0 | 0 |
| Al-Anbar | 0 | 0 | 0 | 0 | 0 |
| Diyala | 28 | 2 | 0 | 1 | 0 |
| Wassit | 146 | 2 | 5 | 0 | 2 |
| Baghdad | 3812 | 11 | 0 | 17 | 6 |
| Babylon | 98 | 29 | 2 | 0 | 20 |
| Karbala | 5 | 15 | 5 | 0 | 0 |
| Al-Najaf | 131 | 37 | 0 | 0 | 37 |
| Al-Qadisia | 0 | 1 | 0 | 0 | 0 |
| Al-Muthana | 0 | 0 | 0 | 0 | 0 |
| Thi-Qar | 248 | 27 | 0 | 0 | 20 |
| Missan | 52 | 0 | 39 | 1 | 4 |
| Al-Basrah | 134 | 1 | 2 | 0 | 0 |
| Total | 5216 | 125 | 68 | 20 | 89 |

**Table 2: Brucellosis in Mesopotamian Buffalo from 2011-2015**

| Province | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| Ninawa | 0 | 0 | 30 | 1 | 1 |
| Kirkuk | 0 | 0 | 0 | 0 | 0 |
| Salah El-din | 0 | 0 | 0 | 0 | 0 |
| Al-Anbar | 0 | 0 | 0 | 0 | 0 |
| Diyala | 0 | 0 | 0 | 0 | 9 |
| Wassit | 0 | 0 | 52 | 0 | 0 |
| Baghdad | 0 | 0 | 0 | 77 | 79 |
| Babylon | 0 | 0 | 0 | 0 | 1 |
| Karbala | 0 | 0 | 0 | 1 | 0 |
| Al-Najaf | 0 | 0 | 0 | 15 | 0 |
| Al-Qadisia | 0 | 0 | 0 | 0 | 0 |
| Al-Muthana | 0 | 0 | 3 | 0 | 0 |
| Thi-Qar | 0 | 0 | 0 | 0 | 23 |
| Missan | 0 | 0 | 3 | 0 | 0 |
| Al-Basrah | 0 | 0 | 0 | 7 | 5 |
| Total | 0 | 0 | 88 | 103 | 118 |

**Table 3: Pasteurellosis in Mesopotamian Buffalo from 2011-2015**

| Province | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| Ninawa | 0 | 0 | 0 | 0 | 0 |
| Kirkuk | 0 | 0 | 0 | 0 | 0 |
| Salah El-din | 20 | 28 | 0 | 0 | 0 |
| Al-Anbar | 0 | 0 | 0 | 0 | 0 |
| Diyala | 41 | 0 | 1 | 0 | 0 |
| Wassit | 0 | 1 | 0 | 0 | 0 |
| Baghdad | 5 | 0 | 0 | 7 | 22 |
| Babylon | 0 | 0 | 0 | 0 | 0 |
| Karbala | 0 | 1 | 1 | 0 | 0 |
| Al-Najaf | 0 | 0 | 0 | 3 | 2 |
| Al-Qadisia | 0 | 0 | 0 | 0 | 0 |
| Al-Muthana | 1 | 0 | 0 | 0 | 0 |
| Thi-Qar | 1 | 8 | 1 | 0 | 4 |
| Missan | 0 | 0 | 9 | 2 | 2 |
| Al-Basrah | 10 | 9 | 1 | 0 | 0 |
| Total | 78 | 47 | 13 | 12 | 30 |

## CONSERVATION PLANS

Artificial Insemination application, ongoing project proposed by IBF, Prof Antonio Borghese which sponsored by FAO and undertaken through Ministry of agriculture, 2017-2018, to widespread super sperms among buffalo herds in Iraq [14]. Anti endemic diseases mass vaccination, annually programs to protected buffaloes from common bacterial infections

(Hemorrhagic Septicemia) [13]. Establishment of genetic recourses department in MOA, mainly for molecular genetic studies and upcoming Mesopotamian buffalo gene bank. Establishments of three Research buffalo centers in north middle and southern parts of country. Feeding rations distribution with loans from agriculture Bank among buffalo farmers. Recording and registration project of buffalo all over Iraq.

## REFERENCES

[1] Jabbar A. Mesopotamian Buffaloes, the origin. Journal of Buffalo Science 2014; 3(1).

[2] Al-Zahery, *et al*. In search of the genetic footprints of Sumerians: a survey of Y-chromosome and mtDNA variation in the Marsh Arabs of Iraq 2011. 2148/11/288-omedcentral.com/1471http://www.bi

[3] ALsaedy KHJ. Iraqi buffalo now. Proceeding 8th World Buffalo Congresses. 1922, Caserta, Italy. It J An im Sci 2007; 6(suppl. 2): 1234-1236 3 (2013) 297-301.

[4] Zeuner FE. A history of domesticated animals. London, Hutchinso 1963.

[5] Cockrill WR. Water Buffalo, FAO. Rome 1977.

[6] Williamson. Empire Journal of Experimental Agriculture 1949; 17: 48-59.

[7] Al-Maliki, *et al*. Karyotyping survey of water buffalo in Iraq, procceding of second buffalo congress. Ministry of Agriculture. Baghdad, Iraq 2011.

[8] Ministry of Agriculture. National LIVESTOCK Census, Baghdad, Iraq 2008.

[9] Jaayid TA, Dragh MA. Genetic diversity among Iraqi buffalo using micro satellites markers. Journal of Agricultural Science and Technology 2013.

[10] Juma KH. Present status in buffalo production in Iraq. Buffalo J 1997; 2: 103-113.

[11] Al-Dafer A. The Archaeology of Power in the Marshes of Southern Mesopotamia PhD,stony Brook Unversity, anthropology, USA 2015.

[12] Iraq.Nature.Org 2009. Personal communication, Southren Marshlands Archieves.the_Qar.Iraq.

[13] Vet_Directorate, Epidemiology Department Livestock reports. Alwazyria, Baghdad, Iraq 2011.

[14] Ministry of Agriculture, Directorate of Animale Resources Country Buffalo Census.

Received on 19-11-2017 Accepted on 10-12-2017 Published on 31-12-2017

DOI: https://doi.org/10.6000/1927-520X.2017.06.03.3