


HOME PAGE: <http://backlin.cabgrid.res.in/buffgr/>

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Introduction

BuffGR is a first comprehensive web genomic resource of buffalo that catalogues 6028881 SNPs and 613403 InDels extracted from the set of 31 buffalo tissues while collectively a total of 7727122 SNPs and 634124 InDels were distributed in Murrah, Bangladesh, Jaffarabadi and Egyptian breeds with reference to Mediterranean breed. It also houses 4504691 SSR markers from all the breeds along with 1702 circRNAs, 37712 lncRNAs and 938 miRNAs. This comprehensive web-resource can widely used by the buffalo community across the globe in studies involving marker trait association, genetic diversity, as biomarker in adultery and breed traceability, in various diseases and other stress conditions. This resource can also be useful in buffalo improvement programs and disease/breed management.

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 **RNAs/Transcripts**
Various non-coding RNAs are included from different tissues of buffalo in this web-resource, which include circRNAs (circular), miRNAs (micro) and lncRNAs (long non-coding).

 **Molecular Markers**
Molecular markers as SNP (single nucleotide polymorphism) along with INDELS (insertion and deletions) and SSR (microsatellite) markers are included in this web resource along with their distribution in various tissues and breeds of buffalo.

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- IncrRNAs

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SNP/INDELS

SNP/INDELS in buffalo

Tissue	Percentage
Bone Marrow	43.3%
Hypophysis	7.4%
Other	49.3%

Tissue wise distribution of SNP/INDELS in buffalo

SSRs

Whole genome Buffalo SSRs

SSR Type	Percentage
Mono-nucleotide SSRs	57%
Di-nucleotide SSRs	19.2%
Tri-nucleotide SSRs	12.4%
Tetra-nucleotide SSRs	8.7%
Penta-nucleotide SSRs	3.4%
Compound SSRs	0.0%
Other	0.0%

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Statistics

- Circular RNAs
- IncrRNAs

Circular RNAs

circRNAs in Buffalo

Tissue	Percentage
Milk	48.9%
Other	51.1%

Tissue wise distribution of circRNAs in buffalo

IncrRNAs

IncrRNAs in Buffalo

Tissue	Percentage
Milk	39.3%
Other	60.7%

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microRNAs


Chromosome wise distribution of miRNAs in Buffalo

Chromosome	Number of miRNAs
1	~10
2	~15
3	~20
4	~25
5	~30
6	~35
7	~40
8	~45
9	~50
10	~55
11	~110
12	~60
13	~65
14	~70
15	~75
16	~80
17	~85
18	~90
19	~95
20	~100
21	~105
22	~110
23	~115
24	~120
X	~125

Chromosome wise distribution of miRNAs in Buffalo

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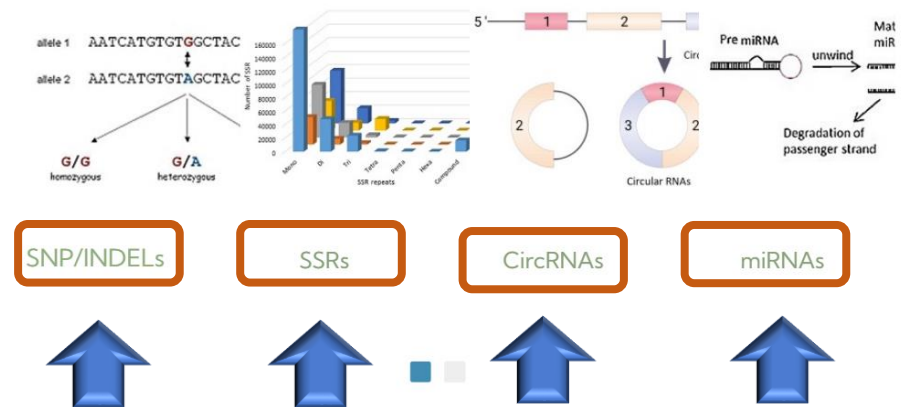


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Data



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SNP search: Tissue-wise

SNP/ INDELS

Select: SNP | Tongue | All | Submit

Select: SNP/INDELS | Breed | Chr | Submit

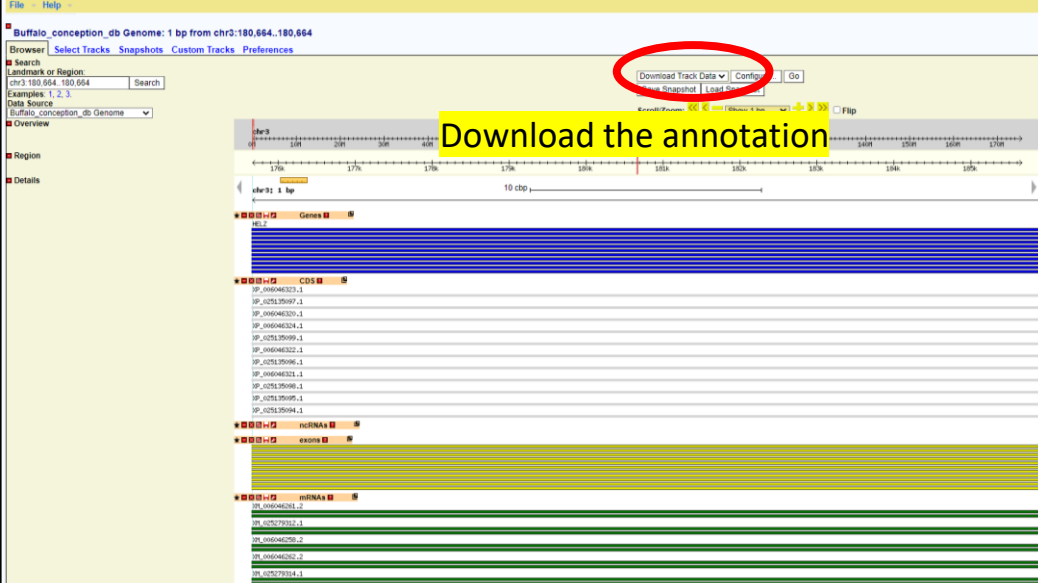
Download data
No INDEL found

Chromosome
All
chr1
chr2
chr3
chr4
chr5
chr6
chr7
chr8
chr9
chr10
chr11
chr12
chr13
chr14
chr15
chr16
chr17
chr18

Genome browser

Download the annotation

Download Track Data | Load Snapshot | Go



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SNP/ INDELS

Tissues

Select: SNP/INDELS | Tissue | Chromosome | Submit

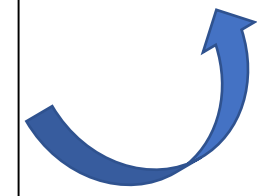
SNP/INDEL **Chromosome**

Select: SNP/INDELS | Breed | Chromosome | Submit

Download data

SNP in all in Buffalo Tongue

S No	Chromosome	Position	Tissue	SNP/ INDELS	SRA ID	Gene ID	Gen	Link to genome
1	Chr1	1144190	Tongue	C/T	ERR315616	102400308	ZNF385D	
2	Chr1	1149834	Tongue	A/G	ERR315616	102400308	ZNF385D	
3	Chr1	3247672	Tongue	T/C	ERR315616	102395814	LOC102395814	
4	Chr1	3249839	Tongue	G/C	ERR315616	102395814	LOC102395814	
5	Chr1	3250335	Tongue	A/T	ERR315616	102395814	LOC102395814	
6	Chr1	3251318	Tongue	T/A	ERR315616	102395814	LOC102395814	
7	Chr1	3251434	Tongue	C/T	ERR315616	102395814	LOC102395814	
8	Chr1	3273681	Tongue	G/C	ERR315616	102409670	PDE10A	
9	Chr1	3441753	Tongue	T/C	ERR315616	102395276	LOC102395276	
10	Chr1	3461453	Tongue	G/A	ERR315616	102395276	LOC102395276	
11	Chr1	3490522	Tongue	A/G	ERR315616	102395276	LOC102395276	
12	Chr1	3491989	Tongue	C/T	ERR315616	102395276	LOC102395276	
13	Chr1	3493342	Tongue	C/T	ERR315616	102395276	LOC102395276	
14	Chr1	3493779	Tongue	G/A	ERR315616	102395276	LOC102395276	
15	Chr1	3495209	Tongue	G/T	ERR315616	102395276	LOC102395276	



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SNP/INDEL search: Breed-wise

SNP/ INDELS

Select: SNP/INDELS Tissue Chromosome

Breed

Select: INDEL Egyptian chr3 Chromosome

SNP/INDEL



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SNP/ INDELS

Select: SNP/INDELS Tissue Submit

Select: SNP/INDELS Breed Chromosome Submit

Download data

SNP in Chr2 of Bangladesh

S No	Chromosome	Position	Breed	SNP/ INDELS	Gene ID	Gene	Link to genome
1	chr2	18951	Bangladesh	A/G	102402422	LOC102402422	
2	chr2	19173	Bangladesh	G/A	102402422	LOC102402422	
3	chr2	19586	Bangladesh	C/T	102402422	LOC102402422	
4	chr2	19704	Bangladesh	C/T	102402422	LOC102402422	
5	chr2	20852	Bangladesh	G/A	112581223	LOC112581223	
6	chr2	23129	Bangladesh	C/T	102402422	LOC102402422	
7	chr2	23937	Bangladesh	G/T	102402422	LOC102402422	
8	chr2	24214	Bangladesh	C/T	102402422	LOC102402422	
9	chr2	24657	Bangladesh	T/C	102402422	LOC102402422	
10	chr2	25946	Bangladesh	C/A	102402422	LOC102402422	
11	chr2	26985	Bangladesh	G/T	102402422	LOC102402422	
12	chr2	27328	Bangladesh	G/A	102402422	LOC102402422	
13	chr2	34669	Bangladesh	A/G	102402751	LOC102402751	
14	chr2	34686	Bangladesh	G/A	102402751	LOC102402751	
15	chr2	37393	Bangladesh	A/G	102402751	LOC102402751	

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SSRs

SSR search: location-wise

Mediterranean genomic SSRs:

Di-nucleotide

chr4

Location

Submit

Other buffalo breed SSRs:

Breeds

SSR motifs

- Location
- All
- Intergenic
- intron
- Promoter-TSS
- Exon
- TTS

SSR search: Breed-wise

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No SSR found

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SSRs

Mediterranean genomic SSRs:

SSR motifs

Chromosome

Location

Submit

Other buffalo breed SSRs:

Breeds

SSR motifs

Submit

Download data

Di-nucleotide SSRs in chr4

SNo	Chr	SSR	Start position	Stop position	Genomic location	Nearest GeneID	Nearest gene	Link to genome
1	chr4	(TA) ₆	67835018	67835029	Intergenic	102393518	LOC102393518	🔗
2	chr4	(GT) ₆	4500297	4500308	Intergenic	102405651	NUP50	🔗
3	chr4	(CA) ₆	31043325	31043336	Intergenic	102402855	rna-XM_006067621.2	🔗
4	chr4	(TG) ₆	31063809	31063820	Intergenic	102403183	SLCO1C1	🔗
5	chr4	(TG) ₁₅	4534895	4534924	Intergenic	102405651	NUP50	🔗
6	chr4	(TG) ₆	31175108	31175119	Intergenic	102403810	LOC102403810	🔗
7	chr4	(TG) ₆	31186606	31186617	Intergenic	102403810	LOC102403810	🔗
8	chr4	(AG) ₁₃	31190224	31190249	Intergenic	102403810	LOC102403810	🔗
9	chr4	(AT) ₆	31193167	31193178	Intergenic	102403810	LOC102403810	🔗
10	chr4	(TC) ₆	4542088	4542099	Intergenic	102405651	NUP50	🔗
11	chr4	(GA) ₆	4542855	4542866	Intergenic	102405651	NUP50	🔗
12	chr4	(AC) ₆	4547359	4547370	Intergenic	112584832	LOC112584832	🔗
13	chr4	(AC) ₁₃	31356856	31356881	Intergenic	102404154	SLCO1A2	🔗
14	chr4	(AC) ₆	31389477	31389488	Intergenic	112584866	LOC112584866	🔗
15	chr4	(TG) ₁₄	31400979	31401006	Intergenic	112584866	LOC112584866	🔗
16	chr4	(TG) ₆	31410422	31410433	Intergenic	112584866	LOC112584866	🔗



CircRNAs

Chromosome

Select: All Tissue All Location

Submit

- Location
- Intergenic
- Intron
- Exon

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CircRNAs search: location-wise

CircRNAs search

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CircRNAs

Select: Tissue Chromosome Location

Submit

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intron region circRNA in all chromosome of All tissue

S No	Chromosome	Start position	Stop position	Genomic location	Gene	Strand	Tissue
1	chr1	188347574	188347811	intron	PDXK	-	Embryo_pool
2	chr10	93834041	93839001	intron	LOC102394634	+	Kidney
3	chr10	76245519	76245792	intron	TRDN	-	Muscle_longissimus_dorsali
4	chr10	76321081	76321272	intron	TRDN	+	Muscle_longissimus_dorsali
5	chr10	76245519	76252851	intron	TRDN	-	Muscle_semitendinosus
6	chr11	100788846	100789091	intron	EPB41L4A	-	Mmammary_gland
7	chr12	98595384	98595520	intron	ODF2	-	Milk
8	chr13	15989137	16066214	intron	LOC102389123	-	Thymus
9	chr15	57568259	57568451	intron	NSMAF	+	Embryo_pool
10	chr15	69912479	69912620	intron	LOC102402027	-	Embryo_pool
11	chr15	63268321	63268553	intron	SPIDR	-	Milk
12	chr16	57434858	57439389	intron	APOA1	-	Cerebellum
13	chr16	57434858	57441862	intron	APOA1	-	Milk
14	chr16	57434858	57439389	intron	APOA1	-	Milk
15	chr16	38651597	38696345	intron	LOC102396589	-	Milk
16	chr16	57434858	57441707	intron	APOA1	-	Milk



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miRNA search

miRNAs

Select miRNA: Chromosome

Chromosome

- All
- chr1
- chr2
- chr3
- chr4
- chr5
- chr6
- chr7
- chr8
- chr9
- chr10
- chr11
- chr12
- chr13
- chr14
- chr15
- chr16
- chr17
- chr18

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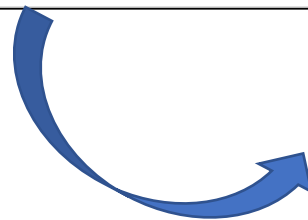


miRNAs

Select miRNA: Chromosome

miRNAs originated from Chr4 with their detail and mRNA targets (Click on miRNA seq to reach its detail and target mRNA/s)

S No	miRNA ID	Chromosome	Start position	Stop position	mature miRNA	Link to genome
1	miR-395	Chr4	12035470	12035548	GAACUUGUUUGGUUAAAGAUCAUGAGGCCAA	🔗
2	miR-396	Chr4	12035398	12035462	UGUGUGUGUAUAUAUAUAUAUAUAUAUG	🔗
3	miR-397	Chr4	12035476	12035544	AUAUGAACUUGUUUGGUUAAAGAUCAUGAG	🔗
4	miR-398	Chr4	12035476	12035544	AUAUGAACUUGUUUGGUUAAAGAUCAUGAG	🔗
5	miR-399	Chr4	12035476	12035544	AUAUGAACUUGUUUGGUUAAAGAUCAUGAG	🔗
6	miR-400	Chr4	12035476	12035544	AUAUGAACUUGUUUGGUUAAAGAUCAUGAG	🔗
7	miR-401	Chr4	12035517	12035599	CUUUGAAAAGUCAGUUAAGCCAGAUAGGCCUU	🔗
8	miR-402	Chr4	12035517	12035599	CUUUGAAAAGUCAGUUAAGCCAGAUAGGCCUU	🔗
9	miR-403	Chr4	12035600	12035662	CAGGAGGUGCGGUUUUUGAGCCUUGG	🔗
10	miR-404	Chr4	12047158	12047229	CUAAGCUGCUAAGUCACUUCAGUCGUGUCU	🔗
11	miR-405	Chr4	12047194	12047264	UGCGACCCCUUAGACGGCAGCCACCAG	🔗
12	miR-406	Chr4	12047194	12047264	UGCGACCCCUUAGACGGCAGCCACCAG	🔗
13	miR-407	Chr4	12047205	12047312	CCAGGCAAGAACACUGGAGUGGGUUG	🔗
14	miR-408	Chr4	12047194	12047264	UGCGACCCCUUAGACGGCAGCCACCAG	🔗
15	miR-409	Chr4	12047403	12047480	AUUGCCUUCUCCUAGACAAACCUAGACAGA	🔗
16	miR-410	Chr4	12047415	12047484	CCUUCUCCAAGACAAACCUAGACAGAUU	🔗
17	miR-411	Chr4	12047466	12047535	GUGUAUAGUCAAGCUAUGGUU	🔗
18	miR-412	Chr4	12047387	12047448	UAUUCUAGGCAAGAGUACUGGAGUGGGGUG	🔗
19	miR-413	Chr4	12047466	12047535	GUGUAUAGUCAAGCUAUGGUU	🔗



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lncRNA search

lncRNAs

Select: Tissue Location

Submit

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lncRNA found

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lncRNAs

Select: Tissue Location

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Exonic lncRNA on chr3 chromosomes of All tissue

S No	lncRNA id	Chromosome	Start position	Stop position	Gene	Class	Tissue
1	TCONS_00085297	chr3	27542603	27541975	TOB1	Exon	Small Intestine
2	TCONS_00088302	chr3	22370639	22370420	LOC112583677	Exon	Obex
3	TCONS_00089224	chr3	54061809	54064104	HSF5	Exon	Hypophysis,Thyroid
4	TCONS_00090430	chr3	26184630	26184125	LOC112583697	Exon	Spinal Cord
5	TCONS_00090914	chr3	12015040	12015374	BAHCC1	Exon	WBC
6	TCONS_00092686	chr3	54208921	54208610	LPO	Exon	Cerebellum
7	TCONS_00095224	chr3	23362610	23361728	PPP1R1B	Exon	Heart;Testis;Milk
8	TCONS_00095422	chr3	31600734	31600934	HS3ST3A1	Exon	Ovary- corpus luteum
9	TCONS_00095525	chr3	1895576	1895318	LOC102394806	Exon	Ovary- corpus luteum
10	TCONS_00095982	chr3	122707455	122707142	LOC112583913	Exon	Ovary-follicle;Testis;Milk
11	TCONS_00096202	chr3	23117605	23118094	ORMDL3	Exon	Oviduct
12	TCONS_00097804	chr3	11730124	11726588	LOC112583632	Exon	Endometrium
13	TCONS_00099295	chr3	32061398	32061636	ELAC2	Exon	Embryo pool
14	TCONS_00099323	chr3	35528762	35529007	CTC1	Exon	Embryo pool;Testis
15	TCONS_00099408	chr3	38927753	38928220	NCBP3	Exon	Embryo pool
16	TCONS_00099545	chr3	46111860	46112077	LOC102400872	Exon	Embryo pool
17	TCONS_00099576	chr3	49633186	49633428	SYNRG	Exon	Embryo pool



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