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Supplementary materials:

Table 1: Sequence ID, database accession number, source organism of cytotoxins, short neurotoxins and related non-toxin proteins and their corresponding functions

Sequence ID	Protein Name	Accession no.	Source organism	Function
CX1.BEC	Cytotoxin 1	117664	*Naja annulifera*	Shows cytolytic activity
CX2.BEC	Cytotoxin 2	117676	*Naja annulifera*	Shows cytolytic activity
CX3.BEC	Cytotoxin 3	117696	*Naja annulifera*	Shows cytolytic activity
CX4.BEC	Cytotoxin 4	117714	*Naja annulifera*	Shows cytolytic activity
CX5.BEC	Cytotoxin 5	117718	*Naja annulifera*	Shows cytolytic activity
CX6.BEC	Cytotoxin 6	117722	*Naja annulifera*	Shows cytolytic activity
CX7.BEC	Cytotoxin 7	117723	*Naja annulifera*	Shows cytolytic activity
CX8.BEC	Cytotoxin 8	117724	*Naja annulifera*	Shows cytolytic activity
CX9.BEC	Cytotoxin 9	117725	*Naja annulifera*	Shows cytolytic activity
CX10.BEC	Cytotoxin 10	117660	*Naja annulifera*	Shows cytolytic activity
CX1.IC	Cytotoxin 1	117667	*Naja naja*	Shows cytolytic activity
CX2.IC	Cytotoxin 2	117680	*Naja naja*	Shows cytolytic activity
CX3.IC	Cytotoxin 3	117700	*Naja naja*	Shows cytolytic activity
CX7.IC	Cytotoxin 7	298351639	*Naja naja*	Shows cytolytic activity
NXS1.BEC	Short neurotoxin 1	55977300	*Naja annulifera*	Produces peripheral paralysis by blocking neuromuscular transmission at the postsynaptic site.
NXS2.BEC	Short neurotoxin 2	128982	*Naja annulifera*	Produces peripheral paralysis by blocking neuromuscular transmission at the postsynaptic site.
NXS3.BEC	Short neurotoxin 3	128986	*Naja annulifera*	Produces peripheral paralysis by blocking neuromuscular transmission at the postsynaptic site.
NXS4.BEC	Short neurotoxin 4	128989	*Naja annulifera*	Produces peripheral paralysis by blocking neuromuscular transmission at the postsynaptic site.
Xenoxin 1	Xenoxin 1	586258	*Xenopus laevis*	Lacks alpha-neurotoxic activity, channel protein activation
Xenoxin 2	Xenoxin 2	731166	*Xenopus laevis*	Lacks alpha-neurotoxic activity, channel protein activation
Xenoxin 3	Xenoxin 3	731167	*Xenopus laevis*	Lacks alpha-neurotoxic activity, channel protein activation
HLMP 1	Leukocyte membrane protein 1	5714377	*Eptatretus stoutii*	Acts upon complement system
HEP21.C	Hep21 protein	45383131	*Gallus gallus*	Related to Ly-6 protein
HEP21.T	Hep21 protein	326930094	*Meleagris gallopavo*	Related to Ly-6 protein
PMF.PS	Plethodontid modulating factor	113912825	*Plethodon shermani*	Act as a pheromone protein, affects female receptivity
PMF.PC	Plethodontid modulating factor	113913043	*Plethodon cheoah*	Act as a pheromone protein, affects female receptivity
PMF.PY	Plethodontid modulating factor	113913185	*Plethodon yonahlossee*	Act as a pheromone protein, affects female receptivity
CD59.H	CD59 glycoprotein	116021	*Homo sapiens*	Potent inhibitor of the complement membrane attack complex (MAC) action
CD58.M	CD59 glycoprotein	13878360	*Mus musculus*	Potent inhibitor of the complement membrane attack complex (MAC) action
CD59.R	CD59 glycoprotein	2507508	*Rattus norvegicus*	Potent inhibitor of the complement membrane attack complex (MAC) action
Ly6H.H	Lymphocyte antigen 6H	10720070	*Homo sapiens*	Involved in cellular interaction, activation of T lymphocytes
Ly6H.CM	Lymphocyte antigen 6H	167008973	*Macaca fascicularis*	Involved in cellular interaction
Ly6H.B	Lymphocyte antigen 6H	167008972	*Bos taurus*	Involved in cellular interaction
Ly6H.M	Lymphocyte antigen 6H	10720078	*Mus musculus*	Involved in cellular interaction
SLURP1.H	Secreted Ly-6/uPAR-related protein 1	3287957	*Homo sapiens*	Has an antitumor activity, Implicated in maintaining the physiological and structural integrity of the keratinocyte layers of the skin.
SLURP1.M	Secreted Ly-6/uPAR-related protein 1	14916717	*Mus musculus*	T cell activation & cell to cell adhesion, Was found to be a marker of late differentiation of the skin
SLURP2.H	Secreted Ly6/uPAR related protein 2	74727391	*Homo sapiens*	Regulation of lymphocyte function
SLURP2.M	Secreted Ly6/uPAR related protein 2	123778205	*Mus musculus*	Regulation of lymphocyte function
Lynx1.H	Ly-6/neurotoxin-like protein 1	47117907	*Homo sapiens*	Seems to modulate nicotinic acetylcholine receptors
Lynx1.C	Ly-6/neurotoxin-like protein 1	61214436	*Pan troglodytes*	Seems to modulate nicotinic acetylcholine receptors
Lynx1.RM	Ly-6/neurotoxin-like protein 1	46576878	*Macaca mulatta*	Seems to modulate nicotinic acetylcholine receptors
Lynx1.BM	Ly-6/neurotoxin-like protein 1	75040497	*Saimiri boliviensis*	Seems to modulate nicotinic acetylcholine receptors
Lynx1.B	Ly-6/neurotoxin-like protein 1	126256577	*Bos taurus*	Seems to modulate nicotinic acetylcholine receptors
Lynx1.M	Ly-6/neurotoxin-like protein 1	24212024	*Mus musculus*	Seems to modulate nicotinic acetylcholine receptors

Table 2: Amino acid composition profile (in %) of various snake venom toxin proteins and related non-toxin proteins of other chordates

Seq. ID	Ala	Cys	Asp	Glu	Phe	Gly	His	Ile	Lys	Leu	Met	Asn	Pro	Gln	Arg	Ser	Thr	Val	Trp	Tyr
CX1.BEC	1.7	13.3	3.3	1.7	1.7	3.3	1.7	1.7	15.0	6.7	3.3	5.0	8.3	0.0	1.7	6.7	6.7	13.3	1.7	3.3
CX2.BEC	3.3	13.3	5.0	1.7	1.7	3.3	1.7	1.7	15.0	8.3	6.7	5.0	10.0	0.0	1.7	1.7	5.0	8.3	1.7	5.0
CX3.BEC	1.7	13.3	3.3	1.7	1.7	3.3	0.0	1.7	15.0	8.3	3.3	6.7	8.3	0.0	1.7	3.3	6.7	11.7	1.7	6.7
CX4.BEC	1.7	13.3	1.7	0.0	1.7	3.3	0.0	3.3	16.7	8.3	3.3	10.0	8.3	0.0	1.7	3.3	6.7	10.0	1.7	5.0
CX5.BEC	3.3	13.3	1.7	1.7	1.7	3.3	1.7	3.3	15.0	6.7	6.7	8.3	10.0	0.0	1.7	1.7	5.0	8.3	1.7	5.0
CX6.BEC	3.3	13.3	3.3	1.7	1.7	3.3	1.7	1.7	15.0	8.3	6.7	6.7	10.0	0.0	1.7	1.7	5.0	8.3	1.7	5.0
CX7.BEC	3.3	13.3	1.7	1.7	1.7	3.3	1.7	1.7	15.0	8.3	6.7	8.3	10.0	0.0	1.7	1.7	5.0	8.3	1.7	5.0
CX8.BEC	1.7	13.3	1.7	1.7	1.7	3.3	1.7	1.7	15.0	8.3	3.3	8.3	8.3	0.0	1.7	3.3	6.7	11.7	1.7	5.0
CX9.BEC	3.3	13.3	5.0	3.3	1.7	3.3	1.7	3.3	11.7	6.7	3.3	6.7	6.7	0.0	3.3	5.0	6.7	11.7	0.0	3.3
CX10.BEC	3.3	13.3	3.3	3.3	1.7	3.3	1.7	5.0	10.0	6.7	3.3	8.3	6.7	1.7	3.3	5.0	6.7	10.0	0.0	3.3
CX1.IC	3.3	13.3	3.3	1.7	0.0	3.3	0.0	3.3	15.0	10.0	3.3	10.0	6.7	0.0	3.3	3.3	5.0	8.3	0.0	6.7
CX2.IC	3.3	13.3	3.3	0.0	1.7	3.3	0.0	1.7	15.0	10.0	3.3	6.7	8.3	0.0	3.3	3.3	5.0	11.7	0.0	6.7
CX3.IC	3.3	13.3	3.3	0.0	1.7	3.3	0.0	3.3	15.0	10.0	3.3	10.0	6.7	0.0	3.3	3.3	5.0	10.0	0.0	5.0
CX7.IC	3.3	13.3	5.0	1.7	0.0	3.3	0.0	3.3	15.0	10.0	3.3	8.3	6.7	0.0	3.3	3.3	5.0	8.3	0.0	6.7
NXS1.BEC	0.0	13.1	3.3	6.6	0.0	8.2	3.3	4.9	9.8	1.6	0.0	8.2	6.6	4.9	6.6	6.6	11.5	1.6	1.6	1.6
NXS2.BEC	0.0	13.1	1.6	3.3	0.0	9.8	3.3	8.2	11.5	0.0	1.6	6.6	6.6	4.9	8.2	4.9	8.2	3.3	1.6	3.3
NXS3.BEC	0.0	13.1	1.6	4.9	1.6	9.8	1.6	9.8	11.5	1.6	1.6	4.9	4.9	6.6	4.9	4.9	8.2	3.3	1.6	3.3
NXS4.BEC	0.0	13.1	1.6	4.9	1.6	9.8	1.6	9.8	11.5	1.6	1.6	4.9	4.9	4.9	6.6	4.9	8.2	3.3	1.6	3.3
Xenoxin-1	6.1	12.1	1.5	6.1	1.5	6.1	0.0	4.5	12.1	10.6	6.1	6.1	1.5	4.5	3.0	4.5	12.1	1.5	0.0	0.0
Xenoxin-2	6.1	12.1	3.0	6.1	1.5	4.5	0.0	6.1	15.2	10.6	6.1	7.6	1.5	3.0	3.0	4.5	7.6	1.5	0.0	0.0
Xenoxin-3	7.6	12.1	3.0	6.1	1.5	4.5	0.0	4.5	13.6	10.6	4.5	6.1	1.5	4.5	3.0	4.5	9.1	3.0	0.0	0.0
HLMP1	4.1	10.8	6.8	5.4	0.0	5.4	1.4	2.7	17.6	4.1	1.4	5.4	1.4	5.4	1.4	6.8	10.8	8.1	0.0	1.4
Hep21.C	5.7	11.4	6.8	8.0	1.1	5.7	1.1	3.4	6.8	6.8	0.0	3.4	2.3	3.4	8.0	6.8	9.1	3.4	1.1	5.7
Hep21.T	5.8	11.6	4.7	10.5	1.2	5.8	0.0	3.5	7.0	7.0	1.2	3.5	2.3	3.5	7.0	7.0	8.1	2.3	1.2	7.0
PMF.PS	3.0	12.1	12.1	16.7	4.5	9.1	1.5	3.0	3.0	6.1	3.0	7.6	3.0	1.5	1.5	0.0	6.1	1.5	0.0	4.5
PMF.PC	3.0	12.1	12.1	16.7	4.5	9.1	1.5	3.0	4.5	6.1	3.0	7.6	3.0	1.5	0.0	0.0	6.1	1.5	0.0	4.5
PMF.PY	3.0	12.1	12.1	16.7	3.0	9.1	3.0	1.5	6.1	6.1	3.0	4.5	3.0	1.5	0.0	0.0	6.1	3.0	0.0	6.1
CD59.H	5.2	13.0	6.5	6.5	5.2	1.3	1.3	1.3	7.8	9.1	0.0	13.0	2.6	3.9	2.6	2.6	7.8	3.9	1.3	5.2
CD59.M	2.7	13.7	5.5	4.1	4.1	2.7	2.7	2.7	5.5	6.8	4.1	5.5	2.7	9.6	2.7	9.6	4.1	5.5	1.4	4.1
CD59.R	6.3	12.7	6.3	2.5	3.8	1.3	0.0	2.5	6.3	8.9	0.0	10.1	3.8	6.3	5.1	10.1	2.5	6.3	1.3	3.8
LY6H.H	4.4	11.1	10.0	1.1	4.4	4.4	3.3	3.3	6.7	5.6	2.2	4.4	3.3	3.3	3.3	13.3	6.7	6.7	1.1	1.1
LY6H.CM	3.3	10.0	10.0	1.1	4.4	4.4	3.3	3.3	6.7	5.6	2.2	4.4	3.3	3.3	3.3	13.3	6.7	7.8	1.1	2.2
LY6H.B	3.3	11.1	10.0	1.1	4.4	3.3	4.4	3.3	6.7	5.6	2.2	4.4	3.3	3.3	2.2	12.2	7.8	7.8	2.2	1.1
LY6H.M	4.7	11.8	10.6	1.2	4.7	2.4	3.5	3.5	7.1	5.9	2.4	4.7	3.5	3.5	3.5	12.9	4.7	7.1	1.2	1.2
SLURP1.H	7.4	12.3	4.9	6.2	3.7	1.2	1.2	3.7	3.7	6.2	2.5	2.5	6.2	1.2	4.9	11.1	12.3	6.2	0.0	2.5
SLURP1.M	9.1	11.4	4.5	4.5	8.0	5.7	2.3	3.4	3.4	4.5	2.3	4.5	6.8	2.3	3.4	8.0	8.0	6.8	0.0	1.1
SLURP2.H	2.7	13.3	5.3	1.3	1.3	9.3	6.7	5.3	1.3	9.3	1.3	2.7	5.3	2.7	4.0	9.3	10.7	5.3	1.3	1.3
SLURP2.M	2.7	13.3	4.0	0.0	2.7	8.0	4.0	5.3	2.7	9.3	1.3	2.7	8.0	2.7	4.0	16.0	5.3	5.3	1.3	1.3
Lynx1.H	5.5	13.7	5.5	1.4	2.7	4.1	2.7	0.0	4.1	2.7	5.5	5.5	5.5	1.4	5.5	6.8	11.0	6.8	0.0	9.6
Lynx1.C	5.5	13.7	5.5	1.4	2.7	4.1	2.7	0.0	4.1	2.7	5.5	5.5	5.5	1.4	5.5	6.8	11.0	6.8	0.0	9.6
Lynx1.RM	5.5	13.7	5.5	1.4	2.7	2.7	2.7	0.0	4.1	2.7	5.5	5.5	5.5	1.4	4.1	9.6	11.0	6.8	0.0	9.6
Lynx1.BM	5.5	13.7	5.5	1.4	2.7	4.1	2.7	0.0	4.1	2.7	5.5	5.5	5.5	1.4	4.1	8.2	11.0	6.8	0.0	9.6
Lynx1.B	4.1	13.7	4.1	2.7	2.7	4.1	2.7	0.0	4.1	2.7	5.5	5.5	5.5	1.4	4.1	9.6	11.0	6.8	0.0	9.6
Lynx1.M	6.8	13.7	2.7	2.7	4.1	4.1	2.7	0.0	5.5	2.7	5.5	2.7	5.5	4.1	5.5	6.8	9.6	5.5	0.0	11.0

Table 3: Physicochemical characterization of different toxin and non-toxin protein sequences

Sequence ID	No. of amino acids	Molecular weight	pI	R^-	R^+	Instability index	Aliphatic Index	GRAVY
CX1.BEC	60	6696.1	9.15	3	10	47.71	72.83	-0.007
CX2.BEC	60	6858.3	8.99	4	10	66.54	66.5	-0.115
CX3.BEC	60	6839.2	9.11	3	10	47.89	74.5	-0.035
CX4.BEC	60	6802.3	9.48	1	11	46.69	76.17	-0.073
CX5.BEC	60	6856.4	9.26	2	10	62.5	66.5	-0.103
CX6.BEC	60	6857.3	9.13	3	10	69.4	66.5	-0.115
CX7.BEC	60	6856.4	9.26	2	10	69.4	66.5	-0.115
CX8.BEC	60	6812.2	9.26	2	10	60.12	74.5	-0.067
CX9.BEC	60	6668.9	8.69	5	9	48.78	76.17	-0.037
CX10.BEC	60	6681.9	8.7	4	8	38.09	77.83	-0.025
CX1.IC	60	6791.2	9.24	3	11	51.27	79.5	-0.192
CX2.IC	60	6763.2	9.36	2	11	52.18	82.67	0.068
CX3.IC	60	6745.2	9.38	2	11	33.94	84.33	0.005
CX7.IC	60	6792.2	9.11	4	11	52.21	79.5	-0.192
NXS1.BEC	61	6843.6	8.71	6	10	79.01	30.33	-1.213
NXS2.BEC	61	6915	9.46	3	12	59.26	41.48	-0.928
NXS3.BEC	61	6885	9.03	4	10	56.6	54.26	-0.577
NXS4.BEC	61	6913.1	9.18	4	11	53.45	54.26	-0.593
Xenoxin 1	66	7235.6	8.88	5	10	44.73	69.55	-0.174
Xenoxin 2	66	7345.8	9.02	6	12	40.3	75.45	-0.239
Xenoxin 3	66	7258.6	8.87	6	11	34.12	75.45	-0.197
HLMP 1	74	8101.3	8.82	9	14	7.97	53.92	-0.799
HEP21.C	88	10001.2	6.73	13	13	26.4	55.45	-0.703
HEP21.T	86	9830.1	5.44	13	12	37.7	53.37	-0.664
PMF.PS	66	7487	3.74	19	3	70	42.88	-0.774
PMF.PC	66	7459	3.74	19	3	71.14	42.88	-0.765
PMF.PY	66	7498.1	3.96	19	4	69.09	41.36	-0.833
CD59.H	77	8961.1	5.18	10	8	33.78	57.01	-0.578
CD58.M	73	8412.6	6.04	7	6	61.92	56.03	-0.315
CD59.R	79	8936.1	8.09	7	9	45.14	69.11	-0.333
Ly6H.H	90	9860.1	6.28	10	9	44.63	58.44	-0.261
Ly6H.CM	90	9948.2	6.28	10	9	44.73	60.56	-0.277
Ly6H.B	90	10012.3	6.02	10	8	47.57	60.56	-0.224
Ly6H.M	85	9456.7	6.28	10	9	47.36	61.88	-0.241
SLURP1.H	81	8853.1	5.16	9	7	56.86	63.83	0.017
SLURP1.M	88	9462.8	5.48	8	6	58.1	59.89	0.114
SLURP2.H	75	8023.2	6.53	5	4	53.41	75.33	0.096
SLURP2.M	75	7948.2	8.12	3	5	68.78	75.33	0.207
Lynx1.H	73	8278.4	8.09	5	7	27.8	36.03	-0.321
Lynx1.C	73	8278.4	8.09	5	7	27.8	36.03	-0.321
Lynx1.RM	73	8239.4	7.64	5	6	37.99	36.03	-0.275
Lynx1.BM	73	8209.3	7.64	5	6	35.94	36.03	-0.27
Lynx1.B	73	8239.4	7.64	5	6	34.9	34.66	-0.305
Lynx1.M	73	8372.6	8.56	4	8	36.55	33.42	-0.281