

Supplementary Table 1. Total nematocyst proteome of *Hydra magnipapillata*.

1. Structural Proteins (94 proteins)

Minicollagens and Proline-rich proteins (27 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.216559	247	Polyproline stretch, CRD	CPP-1
2.	Hma2.234334	170	Proline-rich Extensin, CRD	CPP-2
3.	Hma2.224938	123	Small proline-rich, Pistil-specific extensin-like	CPP-3
4.	Hma2.210169	95	Pistil-specific extensin-like	CPP-4
5.	Hm-Ncol-1	443	GXY repeat, Proline-rich, CRD	Minicollagen-1
6.	Hm-Ncol-2	311	GXY repeat, Proline-rich, CRD	Minicollagen-2
7.	Hm-Ncol-3	404	GXY repeat, Proline-rich	Minicollagen-3
8.	Hm-Ncol-4	531	GXY repeat, Proline-rich	Minicollagen-4
9.	Hm-Ncol-5	1170	GXY repeat, Proline-rich, CRD	Minicollagen-5
10.	Hm-Ncol-6	1232	GXY repeat, Proline-rich, CRD	Minicollagen-6
11.	Hm-Ncol-7	129	GXY repeat, Proline-rich, CRD	Minicollagen-7
12.	Hm-Ncol-8	359	GXY repeat, Proline-rich	Minicollagen-8
13.	Hm-Ncol-9	139	GXY repeat, Proline-rich	Minicollagen-9
14.	Hm-Ncol-10	305	GXY repeat, Proline-rich, CRD	Minicollagen-10
15.	Hm-Ncol-12	224	GXY repeat, Proline-rich, CRD	Minicollagen-12
16.	Hm-Ncol-13	417	GXY repeat, Proline-rich	Minicollagen-13
17.	Hm-Ncol-14	91	GXY repeat, Proline-rich	Minicollagen-14
18.	Hm-Ncol-15	299	GXY repeat, Proline-rich, CRD	Minicollagen-15
19.	Hm-Ncol-16	71	GXY repeat, Proline-rich, CRD	Minicollagen-16
20.	Hm-Ncol-17	110	GXY repeat, Proline-rich, CRD	Minicollagen-17
21.	Hma2.225439	692	Gal-lectin/ SUEL lectin with GXY repeat	Collectin
22.	Hma2.222911	71	Gal-Lectin, GXY repeat	Collectin
23.	Hma2.219592	106	GXY repeat	Minicollagen-21
24.	Hma2.221111	67	Proline-rich, extension, CRD	CPP-5
25.	Hma2.231401	202	GXY repeat, CRD	Minicollagen-18
26.	Hma2.229732	172	Proline-rich extensin, Collagen alpha chain	Minicollagen-19
27.	Hma2.228331	51	GXY repeat, coiled-coil, CRD	Minicollagen-20

Other ECM motif proteins (47 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.208346	535	vWFA	vWFA domain protein
2.	Hma2.224888	869	vWFA ⁽²⁾	vWFA domain protein
3.	Hma2.217303	223	vWFA, Tyrosinase	vWFA - Tyrosinase domain protein
4.	Hma2.225431	107	vWFA, RT superfamily	vWFA - RT domain protein
5.	Hma2.210445	61	vWFA	vWFA domain protein
6.	Hma2.206870	727	Fibronectin type 2 domain, Kringle-like fold	Fibronectin type 2 domain with metallopeptidase activity
7.	Hma2.202740	1570	vWFA ⁽²⁾	vWFA domain protein
8.	Hma2.207178	415	vWFA	vWFA domain protein
9.	Hma2.221706	114	MDN1, AAA ATPase containing vWFA, Zinc finger, C2H2-type, CRD	MDN1, AAA ATPase containing vWFA protein
10.	Hma2.208994	110	TSP1 /vWFA domain	Thrombospondin, type I with vWFA domain
11.	Hma2.229042	85	Tetraspanin, extracellular domain or large extracellular loop (LEL), CD9/CD37/CD63 antigen	Tetraspanin, extracellular domain protein
12.	Hma2.230661	155	Thrombospondin, type 1 repeat ⁽²⁾	Thrombospondin, type 1 repeat protein
13.	Hma2.23247	109	vWFA ⁽²⁾ , collagen triple helix ⁽⁷⁾	vWFA domain protein with collagen triple helix
14.	Hma2.214763	274	TSP1 (16), vWFA ⁽²⁾	Thrombospondin type 1 repeat protein with vWFA domain
15.	Hma2.202695	260	vWFA domain, Laminin_I	vWFA, Laminin_I domain protein
16.	Hma2.217815	206	AAA ATPase containing vWFA, Concanavalin A-like lectin/glucanase	AAA ATPase containing vWFA
17.	Hma2.205498	190	vWFA_subfamily_ECM_rve, Integrase core domain/ Ribonuclease H fold	vWFA, Integrase domain protein

18.	Hma2.224219	1717	vWFA, ZnMc_astacin-like, PRK09707, putative lipoprotein, PCEMA1	vWFA, ZnMc, PCEMA1
19.	Hma2.218227	269	TSP1 ⁽²⁰⁾ , vWFA ⁽³⁾ , GON domain	TSP1, vWFA, GON domains protein
20.	Hma2.203577	203	TSP1 ⁽²⁾ , Fibronectin type II, collagen-binding, Concanavalin A-like lectin/glucanase, Kringle-like fold	TSP1 Fibronectin domain protein
21.	Hma2.227746	318	Fibronectin Type II, collagen-binding, Kringle-like fold	Fibronectin Type II-kringle-like domain protein
22.	Hma2.217614	85	MAM ⁽¹⁴⁾ , Fibronectin Type II	MAM domain protein
23.	Hma2.211325	71	Thrombospondin, type 1 repeat	Thrombospondin, type 1 repeat protein
24.	Hma2.232918	62	Thrombospondin, type 1 repeat	Thrombospondin, type 1 repeat protein 3 / PQ rich protein
25.	Hma2.223414	105	SCP_GAPR-1-like, TSP1	SCP-like extracellular with TSP1
26.	Hma2.214292	2193	Gal_Lectin ⁽⁷⁾ / SUEL lectin	Hepta Gal-lectin
27.	Hma2.218987	524	Gal-lectin/ SUEL lectin	Gal-lectin/ SUEL lectin
28.	Hma2.203002	329	Gal_Lectin ⁽⁴⁾ / SUEL lectin	Gal-lectin/ SUEL lectin
29.	Hma2.213810	233	Gal-lectin/ SUEL lectin, CRD	Gal-lectin/ SUEL lectin
30.	Hma2.218989	161	Gal-lectin/ SUEL lectin	Gal-lectin/ SUEL lectin
31.	Hma2.217630	489	D-galactoside/L-rhamnose binding SUEL lectin	D-galactoside/L-rhamnose binding SUEL lectin
32.	Hma2.201706	71	Gal_Lectin, GPCR, family 2, trophophilin	Gal_Lectin domain protein
33.	Hma2.229916	458	C-type lectin ⁽²⁾	Madhavi protein
34.	Hma2.226267	1214	SCP_GAPR-1, C-Lectin, SEA, CRD	NOWA
35.	Hma2.215621	2021	vWFA, SCP_GAPR-1, C-Lectin, CRD	NOWA-like protein
36.	Hma2.206417	1453	C-Lectin	C-Lectin domain protein
37.	Hma2.228644	3151	C-Lectin, PA14, LamG	Vimala protein
38.	Hma2.211381	366	SEA domain ⁽²⁾ , CRD	SEA domain protein
39.	Hma2.208240	130	Thyroglobulin type I repeat, GON domain, SEA domain	Thyroglobulin type I repeat protein
40.	Hma2.226676	373	Carbohydrate-binding WSC	Carbohydrate-binding WSC domain protein
41.	Hma2.200137	261	Carbohydrate-binding WSC	Carbohydrate-binding WSC domain protein
42.	Hma2.206921	114	FA58C/Galactose binding-like	FA58C/Galactose binding-like protein
43.	Hma2.206786	638	Pentraxin / LamGL	Geeta protein
44.	Hma2.224520	2690	TSP1, Fibrinogen ReD, LamGL	Rajukutty protein
45.	Hma2.216773	146	FA58C ⁽³⁾ , LamGL ⁽²⁾ , TSP1, PLAT/LH2	Seven domain Protein
46.	Hma2.213412	449	FA58C, LamGL, CUB	Kragl protein
47.	Hma2.218528	179	Glyco_hydro_16 / Concanavalin A-like lectin/glucanase	Glycoside Hydrolase 16

Glycine-rich Proteins (4 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.228381	76	Glycine/Histidine-rich domain	Spinalin
2.	Hma2.219071	88	Glycine/Glutamine-rich elastic domain, CRD	Cnidoin
3.	Hma2.224221	945	--	E rich protein
4.	Hma2.221195	104	--	G rich protein

Other Structural Proteins (16 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.213345	776	Myosin motor domain, type II, Myosin_tail_1	Myosin motor domain protein
2.	Hma2.215937	323	Chitin-binding domain type 2 ⁽³⁾ , Rhodanese Homology domain	Chitin-binding domain type 2 protein
3.	Hma2.209281	597	DKK related Cysteine-rich domain	DKK-3 family protein
4.	Hma2.224574	556	DKK related Cysteine-rich domain	HyDKK3
5.	Hma2.230887	542	DKK related Cysteine-rich domain	DKK-3 family protein
6.	Hma2.217561	138	Chitin-binding domain type 2 ⁽⁴⁾	Chitin binding protein
7.	Hma2.229697	79	Chitin_bind_3	Chitin binding protein
8.	Hma2.211682	175	Fascin-like domain	Fascin-like domain protein (PPOD2 peroxidase)
9.	Hma2.211683	92	Fascin-like domain	Fascin-like domain protein
10.	Hma2.205478	67	Fascin-like domain	Fascin-like domain protein
11.	Hma2.209361	3995	SMC domain (Chromosome segregation ATPases)	SMC domain protein
12.	Hma2.209360	111	SMC, Chromosome segregation ATPases	SMC domain protein
13.	Hma2.214493	105	WD40 domain	WD40 domain protein
14.	Hma2.218222	160	Chitin binding protein, peritrophin-A	Chitin binding protein
15.	Hma2.231049	76	DKK family	DKK 3 related protein
16.	Hma2.213243	55	WD40 repeat-like/LRR kinase 2 related	WD40 repeat-like protein

2. Calcium Modulators (20 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.228411	2218	MACPF, EGF_Ca	MACPF domain protein
2.	Hma2.213553	595	MACPF, EGF_Ca	MACPF domain protein
3.	Hma2.208638	129	MACPF, EGF_Ca	MACPF domain protein
4.	Hma2.208541	739	EGF-like domain	EGF-like domain protein
5.	Hma2.219065	74	EGF_Ca ⁽²⁾	EGF_Ca domain protein
6.	Hma2.227350	58	EGF_Ca	EGF_Ca domain protein
7.	Hma2.221665	84	EGF_Ca ⁽⁴⁾	EGF_Ca domain protein
8.	Hma2.208773	407	MACPF	MACPF domain protein
9.	Hma2.212260	643	MACPF, EGF_Ca	MACPF, EGF_Ca domain protein 1
10.	Hma2.224448	424	MAC/Perforin domain, EGF_Ca	MACPF, EGF_Ca domain protein
11.	Hma2.219067	197	EGF_Ca/Type 3, Phospholipase A2, eukaryotic	EGF_Ca, Phospholipase A2 domain protein
12.	Hma2.210123	179	EGF_Ca	EGF-Ca domain protein
13.	Hma2.210121	149	EGF_Ca	EGF-Ca domain protein
14.	Hma2.211690	148	EGF-like, type 3/ EGF_Ca ⁽⁶⁾	EGF-Ca domain protein
15.	Hma2.227218	63	EGF-like, type 3	EGF-like, type 3 protein
16.	Hma2.211693	327	EGF_Ca ⁽²⁾ , RT_nLTR, Formate/nitrite transporter	EGF_Ca (2) Formate/nitrite transporter domain protein
17.	Hma2.211735	608	Annexin (4)	Annexin
18.	Hma2.210146	584	Calcium-binding EF-hand, Aldolase superfamily	Calcium-binding EF-hand protein
19.	XP_002167668	353	EF-hand ⁽²⁾	Nematocalcin
20.	Hma2.228383	143	Annexin repeats (4), HMW glutenin	Annexin repeats protein with HMW glutenin domain

3. Venoms (55 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.223178	771	Anemone_cytotox	Anemone_cytotox protein
2.	Hma2.224206	642	PLA2_bee_venom-like	PLA2_bee_venom-like protein
3.	Hma2.210456	281	PLA2_bee_venom-like	PLA2_bee_venom-like protein
4.	Hma2.227448	145	PLA2_bee_venom-like	PLA2_bee_venom-like protein
5.	Hma2.223740*	589	PRK05771, V-type ATP synthase subunit, TM	Toxin precursor
6.	Hma2.210268*	565	Toxin precursor Cnidocyst Hemolysis signal-A-sequence, TM	Toxin precursor
7.	Hma2.209939	61	Metridin-like ShK toxin	ShK toxin domain protein
8.	Hma2.217198	371	ZnMc_astacin-like, ShKT toxin	ShKT toxin domain protein
9.	Hma2.212832	233	ZnMc_astacin-like, ShKT toxin	ShKT toxin domain protein
10.	Hma2.228188	51	ZnMc_astacin-like, ShKT toxin	ShKT toxin domain protein
11.	Hma2.227742*	2201	Fibronectin Type 2	FN2 domain protein (toxin)
12.	Hma2.228615	76	ZnMc_astacin-like, Metridin-like ShK toxin	Zinc Metalloproteinase protein
13.	Hma2.212831	120	ZnMc_astacin-like, ShK toxin domain	Zinc-dependent metalloproteinase with ShKT
14.	Hma2.226192*	838	--	Toxin-A protein
15.	Hma2.221138	380	Toxin precursor cnidocyst hemolysis signal a sequencing/ TM	Toxin precursor protein 1
16.	Hma2.225641	322	Dipeptidyl peptidase IV/Peptidase S9, prolyl oligopeptidase, Esterases and lipases	Venom dipeptidylpeptidase IV
17.	Hma2.226366	1374	SCP ⁽⁴⁾	Tetra SCP protein
18.	Hma2.234447	308	SCP_GAPR-1-like	SCP_GAPR-1-like protein
19.	Hma2.231910	146	SCP_GAPR-1-like	SCP_GAPR-1-like protein
20.	Hma2.219114	77	SCP_GAPR-1-like	SCP_GAPR-1-like protein
21.	Hma2.201457	75	SCP_GAPR-1-like	SCP_GAPR-1-like protein
22.	Hma2.226368	811	SCP-like extracellular ⁽²⁾	SCP-like extracellular protein
23.	Hma2.207560	581	SCP_GAPR-1-like, Allergen V5/Tpx-1 related	SCP_GAPR-1-like protein
24.	Hma2.204928	397	Allergen V5/Tpx-1 related, SCP-like extracellular	SCP-like extracellular protein
25.	Hma2.204927	350	SCP_GAPR-1-like ⁽²⁾ Allergen V5/Tpx-1 related	SCP_GAPR-1-like protein
26.	Hma2.226365	318	SCP_GAPR-1-like /Allergen V5/Tpx-1 related	SCP_GAPR-1-like protein
27.	Hma2.210044	194	SCP_GAPR-1-like/Allergen V5-Tpx-1 related	SCP_GAPR-1-like protein
28.	Hma2.200735	161	SCP_GAPR-1-like/ Allergen V5/Tpx-1 related	SCP_GAPR-1-like protein
29.	Hma2.221381	129	SCP_GAPR-1-like ⁽²⁾	SCP_GAPR-1-like protein
30.	Hma2.226361	85	SCP_GAPR-1-like ⁽²⁾	SCP_GAPR-1-like protein

31.	Hma2.226363	613	Allergen V5/Tpx-1 related, SCP-like extracellular	SCP domain neurofilament-like protein
32.	Hma2.231443	176	SCP_GAPR-1-like, Transposase_1, COG3415	SCP COG3415 domain protein
33.	Hma2.230680	648	WD40, DUF938, Methyltransf_12, Cytosolic fatty-acid binding	WD40 domain protein
34.	Hma2.225244	416	BPTI / Kunitz family, Thyroglobulin type I repeats ⁽³⁾	BPTI / Kunitz family, Thyroglobulin type I repeat protein
35.	Hma2.221663	102	EGF_Ca ⁽⁴⁾	EGF_Ca domain protein
36.	Hma2.231922	343	EGF_Ca	EGF-Ca domain protein
37.	Hma2.227484	156	FA58C, EGF_Ca, CCP (2), HYR, GCC2_GCC3	Penta domain protein
38.	Hma2.219403	122	EF-hand ⁽²⁾	EF-hand, calcium binding motif protein
39.	Hma2.221233	75	EF-hand ⁽²⁾	EF-hand, calcium binding motif protein
40.	Hma2.215087	473	ZnMc_astacin_like	Zinc Metallopeptidase protein
41.	Hma2.220229	96	ZnMc_astacin_like	Zinc Metallopeptidase protein
42.	Hma2.234459	59	ZnMc_astacin_like	Zinc Metallopeptidase protein
43.	Hma2.226508	614	Zn_Mc, Coagulation factor 5/8 C-terminal domain	Zinc Metallopeptidase protein
44.	Hma2.220231	89	Zn_Mc, astacin_like subfamily or peptidase family M12A	Zinc Metallopeptidase protein
45.	Hma2.207911	385	Peptidase M12A, astacin	Peptidase M12A, astacin protein
46.	Hma2.227078	560	THAP domain, ZnMc_astacin_like, Zinc finger, C2CH-type	Zinc-dependent metalloprotease protein
47.	Hma2.223034	240	Zinc-dependent metalloprotease	Zinc-dependent metalloprotease protein
48.	Hma2.204845	207	Zinc-dependent metalloprotease	Zinc-dependent metalloprotease protein
49.	Hma2.207176	181	Zinc-dependent metalloprotease	Zinc-dependent metalloprotease protein
50.	Hma2.224518	149	Zinc-dependent metalloprotease	Zinc-dependent metalloprotease protein
51.	Hma2.203444	417	Trypsin-like serine protease	Trypsin-like serine protease
52.	Hma2.226598	373	Trypsin-like serine protease	Trypsin-like serine protease
53.	Hma2.230838	291	Trypsin-like serine protease domain in C-terminus	Trypsin-like serine protease
54.	Hma2.220315	54	Trypsin-like serine protease	Trypsin-like serine protease
55.	Hma2.220996	67	Glyco_hydro_56, rve, Integrase core	Hyaluronoglucosaminidase

* exclusive to Cnidaria

4. Novel Proteins (127 proteins)

Novel proteins type 1- unique to Hydra nematocyst proteome (68 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.226049	510	--	sT1NP1
2.	Hma2.231441	504	--	sT1NP2
3.	Hma2.212477	452	--	sT1NP3
4.	Hma2.225499	348	--	sT1NP4
5.	Hma2.210821	293	--	sT1NP5
6.	Hma2.227355	284	--/ CRD	sT1NP6
7.	Hma2.229956	171	--	sT1NP7
8.	Hma2.214076	168	--	sT1NP8
9.	Hma2.227774	168	--	sT1NP9
10.	Hma2.232927	144	--	sT1NP10
11.	Hma2.223909	143	--	sT1NP11
12.	Hma2.221196	140	--	sT1NP12
13.	Hma2.219142	122	--	sT1NP13
14.	Hma2.220999	1049	--	sT1NP14
15.	Hma2.216332	84	--	sT1NP15
16.	Hma2.215653	72	--	sT1NP16
17.	Hma2.207672	70	--	sT1NP17
18.	Hma2.232289	68	--	sT1NP18
19.	Hma2.213764	321	--	T1NP1
20.	Hma2.206547	106	--/ TM	T1NP3
21.	Hma2.230385	72	--	T1NP4
22.	Hma2.228816	57	--	T1NP5
23.	Hma2.203447	572	--	T1NP6
24.	Hma2.232573	69	--	T1NP7
25.	Hma2.205707	926	--	sT1NP19
26.	Hma2.205574	711	--	sT1NP20
27.	Hma2.220123 ³	618	--	sT1NP21

28.	Hma2.211580 ¹	615	--	sT1NP22
29.	Hma2.223666	577	--	sT1NP23
30.	Hma2.223834	539	--	sT1NP24
31.	Hma2.230174	403	--	sT1NP25
32.	Hma2.223672 ³	274	--	sT1NP26
33.	Hma2.223671 ²	138	--	sT1NP27
34.	Hma2.218494	70	PAN/APPLE-like domain	sT1NP28
35.	Hma2.221622	54	--	sT1NP29 / zebra precursor protein
36.	Hma2.215360	712	--	sT1NP30
37.	Hma2.209014 ²	414	--	sT1NP31
38.	Hma2.209013 ³	353	--	sT1NP32
39.	Hma2.204313	116	--	sT1NP33
40.	Hma2.203001	54	--	sT1NP34
41.	Hma2.231442	1830	SR, Scavenger receptor Cys-rich	SR repeat protein/ T1NP8
42.	Hma2.227833	1534	--	T1NP9
43.	Hma2.223937	795	Peptidase, cysteine peptidase active site	Putative cysteine peptidase/ T1NP10
44.	Hma2.211326	704	HTH_MARR, helix_turn_helix, Homeodomain-like, Transposase_5, Alpha-L-arabinofuranosidase B	T1NP11
45.	Hma2.227744	413	helix-turn-helix, Psq domain	T1NP12
46.	Hma2.220917	344	--	T1NP13
47.	Hma2.209012 ²	311	--	T1NP14
48.	Hma2.214835	275	--	T1NP15
49.	Hma2.223748	254	--	T1NP16
50.	Hma2.215993	245	--	T1NP17
51.	Hma2.211497	143	Phosphopantetheine	T1NP18
52.	Hma2.224451	88	--	T1NP19
53.	Hma2.226783	71	--	T1NP20
54.	Hma2.228629	592	--	T1NP21
55.	Hma2.210625	245	--	sT1NP35
56.	Hma2.219240	224	--	sT1NP36
57.	Hma2.202745	289	Concanavalin A-like lectin/glucanase	sT1NP37
58.	Hma2.231389	130	--	sT1NP38
59.	Hma2.202690	169	--	sT1NP39
60.	Hma2.205947	359	--	T1NP22
61.	Hma2.210626	274	--	T1NP23
62.	Hma2.201446	226	--	T1NP24
63.	Hma2.207867	194	--	T1NP25
64.	Hma2.212164	77	--	T1NP26
65.	Hma2.204835	56	--	T1NP27
66.	Hma2.202946	66	--	T1NP28
67.	Hma2.209593	294	APPLE_Factor_XI-like	sT1NP40
68.	Hma2.209218	330	--	sT1NP41

¹corresponds to XP_002159367; ²corresponds to XP_002158350; ³corresponds to XP_002158350; ³corresponds to XP_02167429; ³corresponds to XP_02167429

Novel proteins type 2 – exclusive to Hydra (12 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.228627	1105	--	sT2NP1
2.	Hma2.204760	540	--	sT2NP2
3.	Hma2.210167	536	--	sT2NP3
4.	Hma2.205649	534	--	sT2NP4
5.	Hma2.208161	382	--	sT2NP5
6.	Hma2.204869	333	--	sT2NP6
7.	Hma2.211599	247	--	sT2NP7
8.	Hma2.215906	62	--	sT2NP8
9.	Hma2.211238	1339	--	T2NP1
10.	Hma2.230175	637	--	T2NP2
11.	Hma2.228631	377	--	T2NP3
12.	Hma2.211236	287	--	T2NP4

Novel proteins type 3 – exclusive to Cnidaria (Nematostella and Hydra) (17 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.203460	658	--	sT3NP1
2.	Hma2.218440	220	--/CRD	sT3NP2
3.	Hma2.228785	208	--	sT3NP3
4.	Hma2.231436	188	Filamin superfamily	sT3NP4
5.	Hma2.222128	105	Whey acidic protein, 4-disulphide core	sT3NP5
6.	Hma2.216085	84	--	sT3NP6
7.	Hma2.230177	236	Sipho_Gp157, PRK03918, chromosome segregation	sT3NP7
8.	Hma2.214508	75	DSL superfamily, WSC superfamily	sT3NP8
9.	Hma2.202345	305	--	T3NP1
10.	Hma2.215640	291	--	T3NP2
11.	Hma2.223833	58	--	sT3NP9
12.	Hma2.230176	523	--	T3NP3
13.	Hma2.215639	266	DUF885	sT3NP10
14.	Hma2.221044	157	--	sT3NP11
15.	Hma2.212171	267	DUF885	T3NP4
16.	Hma2.205348	236	Thioredoxin-like fold	T3NP5
17.	Hma2.232177	60	--	SN rich Protein/ T3NP6

Novel proteins type 4 - not exclusive to Cnidaria (30 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.202738	660	--	sT4NP1
2.	Hma2.232290	473	--	sT4NP2
3.	Hma2.223665	447	--	sT4NP3
4.	Hma2.202895	330	--	sT4NP4
5.	Hma2.208728	2059	--	sT4NP5
6.	Hma2.219109	267	--	sT4NP6
7.	Hma2.207809	187	--	sT4NP7
8.	Hma2.224724	145	--	sT4NP8
9.	Hma2.225171	80	--	sT4NP9
10.	Hma2.212242	1607	--	sT4NP10
11.	Hma2.213404	59	--	sT4NP11
12.	Hma2.210849	392	--	sT4NP12
13.	Hma2.213766	89	--	sT4NP13
14.	Hma2.206574	121	--	sT4NP14
15.	Hma2.230828	86	--	sT4NP15
16.	Hma2.223777	395	--	sT4NP16
17.	Hma2.213742	173	--	sT4NP17
18.	Hma2.214446	293	--	sT4NP18
19.	Hma2.206027	231	--	sT4NP19
20.	Hma2.217458	193	--	sT4NP20
21.	Hma2.213762	337	--	sT4NP21
22.	Hma2.228106	1203	--	T4NP1
23.	Hma2.228626	445	TonB box	T4NP2
24.	Hma2.226781	349	--/ TM	T4NP3
25.	Hma2.212240	150	--	T4NP4
26.	Hma2.213314	113	--	T4NP5
27.	Hma2.219945	107	--	T4NP6
28.	Hma2.207946	58	--	T4NP7
29.	Hma2.212170	119	DUF885	T4NP8
30.	Hma2.228805	197	--	T4NP9

5. Peptidases (35 proteins)

Metallopeptidases (27 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.228823	1341	Peptidase_M13_N ⁽²⁾	Peptidase_M13 protein
2.	Hma2.229432	1148	Peptidase_M13_N ⁽²⁾	Peptidase_M13 protein
3.	Hma2.231450	585	Peptidase_M1	Peptidase_M1 protein
4.	Hma2.230132	569	Peptidase_M13 ⁽²⁾	Peptidase_M13 protein
5.	Hma2.233930	631	Peptidase M2 Angiotensin converting enzyme	Peptidase M2 protein
6.	Hma2.206419	545	Peptidase_M14, Zinc carboxypeptidase, CAP-Gly domain	Peptidase_M14 protein
7.	Hma2.215984	534	Peptidase M14, carboxypeptidase A	Peptidase M14 protein
8.	Hma2.230133	484	Peptidase_M13_N	Peptidase_M13_N protein (endothelin-converting enzyme 1)
9.	Hma2.224700	329	Peptidase_M13	Peptidase_M13 protein
10.	Hma2.214264	245	Peptidase_M1	Peptidase_M1 protein
11.	Hma2.220602	213	Peptidase_M14 ⁽³⁾ , RVT_1, murein peptide amidase A	Peptidase M14 protein
12.	Hma2.230129	205	Peptidase family M13	Peptidase M13 protein
13.	Hma2.232373	136	Peptidase_M28	Peptidase_M28
14.	Hma2.225164	65	Peptidase_M14, Zinc carboxypeptidase	Peptidase_M14 protein
15.	Hma2.217050	145	ZnMc_ADAMTS-like, TSP1	Zinc Metallopeptidase protein
16.	Hma2.230134	146	Peptidase M13, neprilysin	Peptidase M13, neprilysin domain protein
17.	Hma2.217049	119	ZnMc_ADAMTS-like/ Reprolysin	Zinc-dependent metalloprotease protein_ ADAMTS-like
18.	Hma2.230128	76	Peptidase_M13_N	Peptidase M13, neprilysin domain protein
19.	Hma2.207177	66	Peptidase M12A, astacin	Peptidase M12A, astacin protein
20.	Hma2.217613	84	MAM (15), Trefoil (P-type) ⁽²⁾	Meprin, A5 protein
21.	Hma2.217281	58	ZnMc_MMP, PG_binding_1	Zinc Metallopeptidase protein
22.	Hma2.231451	1338	Peptidase_M1 (2)	Peptidase M1 domain protein
23.	Hma2.224191	290	Peptidase family M2 Angiotensin converting enzyme	Peptidase family M2 Angiotensin converting enzyme
24.	Hma2.212166	76	ZnMc_BMP1_TLD	Peptidase M12A, astacin protein
25.	Hma2.230127	434	Peptidase family M13	Peptidase M13 domain protein
26.	Hma2.217051	255	TSP_1(1), CUB (2), Whey acidic protein, 4-disulphide core, Peptidase M12B, ADAM-TS	Similar to ADAM metallopeptidase with TSP1, CUB domains
27.	Hma2.226148	175	Peptidase_M14, Zinc carboxypeptidase	Peptidase_M14, Zinc carboxypeptidase

Serine peptidases (5 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.230756	825	Peptidase_S8, P protein	Peptidase S8 protein (Kex2-like endoprotease)
2.	Hma2.206020	333	Peptidase_S8, Subtilase family and PA domain	Peptidase S8 protein
3.	Hma2.221006	360	Peptidase_S8 ⁽²⁾ , P_protein	Peptidase S8 protein
4.	Hma2.228725	87	Serine carboxypeptidase S28	Peptidase S28 protein
5.	Hma2.230757	493	P proprotein, Peptidase S8 and S53, subtilisin, kexin, sedolisin, Galactose-binding-like	Kex2-like endoprotease

Cysteine peptidases (3 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.231800	311	Peptidase C1A subfamily	Peptidase C1A protein
2.	Hma2.214055	95	Peptidase_C1A, Inhibitor_I29, Cathepsin propeptide inhibitor domain	Peptidase C1A protein
3.	Hma2.224909	125	Peptidase_C1A, Inhibitor_I29, Rota_VP2	Peptidase C1A protein

6. Metabolic Enzymes (32 Proteins)

Carbonic Anhydrases (9 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.205404	958	Alpha_CA	Alpha Carbonic Anhydrase protein
2.	Hma2.230311	603	Alpha CA	Alpha Carbonic Anhydrase protein
3.	Hma2.208819	257	Alpha_CA, hAT family dimerisation domain	Alpha Carbonic Anhydrase protein
4.	Hma2.221613	238	Alpha_CA_prokaryotic-like	Alpha Carbonic Anhydrase protein
5.	Hma2.226119	104	Alpha_CA, ZnF_TTF	Alpha Carbonic Anhydrase protein
6.	Hma2.201739	933	alpha_Carbonic anhydrase	Carbonic anhydrase VII
7.	Hma2.200790	292	Carbonic anhydrase, eukaryotic	Alpha Carbonic anhydrase protein
8.	Hma2.213538	235	Carbonic anhydrase, eukaryotic	Alpha Carbonic anhydrase protein
9.	Hma2.205318	144	alpha_Carbonic anhydrase	Alpha Carbonic anhydrase protein

Glutamate Metabolism (9 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.231813	494	Glutamine amidotransferase (GATase1) domain	Folyl-polygamma-glutamyl hydrolase
2.	Hma2.231816	297	Glutamine amidotransferase (GATase1) domain	Glutamine amidotransferase
3.	Hma2.211598	352	Glutamine amidotransferase (GATase1) domain	Glutamine amidotransferase
4.	Hma2.228945	1136	Gamma-glutamyltranspeptidase	Gamma-glutamyltranspeptidase
5.	Hma2.222066	401	Gamma-glutamyltranspeptidase	Gamma-glutamyltranspeptidase
6.	AY372112[†]	91	Protein phosphatase 2A	poly-gamma-glutamate synthesis protein
7.	Hma2.218845	191	Peptidase_M28, TFR_dimer	Folylpoly-gamma-glutamate carboxypeptidase
8.	Hma2.221597	53	GATase1-like domain/ Peptidase C26	Peptidase C26, gamma-glutamyl hydrolase
9.	Hma2.224040	317	Protein phosphatase 2A	Cap A2 protein

[†]2D Gel Data

Glycoside hydrolases (5 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.222377	836	Glyco_hydro_20 ⁽²⁾	Glycoside Hydrolase 20
2.	Hma2.212228	107	GH18_chitolectin_chitotriosidase, Glycoside hydrolase, family 18, catalytic domain	Chitinase 1 precursor
3.	Hma2.222634	290	Glycoside hydrolase, family 20, beta-N-acetylhexosaminidase-like	Beta-N-acetyl hexosaminidase-like protein
4.	Hma2.219971	275	Glycoside hydrolase	Glycoside hydrolase protein
5.	Hma2.208934	231	Glyco_hydro_2_C, Glyco_hydro_2_N, Galactose-binding-like	Glucuronidase, beta

Protease-associated Glycosidase (1 protein)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.219796	565	Protease-associated (PA) domain, Peptide-N-glycosidase F	PA domain Peptide-N-glycosidase F protein

Other Carbohydrate-modifying Enzymes (8 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.216082	907	Alpha_L_fucos,Alpha-L-fucosidase	Alpha-L-fucosidase
2.	Hma2.222989	806	Predicted bile acid beta-glucosidase, MAP7, tolA	Bile acid glucosidase domain protein
3.	Hma2.222992	526	DUF608, Six-hairpin, glycosidase-like	DUF608, Six-hairpin, glycosidase-like
4.	Hma2.221275	128	Alpha-L-arabinofuranosidase B	Alpha-L-arabinofuranosidase B protein
5.	Hma2.225146	75	AbfB, Alpha-L-arabinofuranosidase B (ABFB) ⁽³⁾	Alpha-L-arabinofuranosidase B
6.	Hma2.217297	71	Alpha-L-arabinofuranosidase B (ABFB)	Alpha-L-arabinofuranosidase B (ABFB)
7.	Contig38567.g4.t1	3159	Alpha-L-arabinofuranosidase B	Alpha-L-arabinofuranosidase B protein
8.	Hma2.221421	79	FBP_aldolase_I_a, Fructose-1,6-bisphosphate aldolase	Fructose-bisphosphate aldolase, class-I

7. Other Enzymes (31 proteins)

Lipase/ Esterases (6 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.209632	299	SGNH_hydrolase	SGNH-hydrolase protein
2.	Hma2.222278	106	SGNH_hydrolase	SGNH-hydrolase protein
3.	Hma2.216338	72	SGNH_hydrolase	SGNH-hydrolase protein
4.	Hma2.210990	447	Esterase, SGNH hydrolase-type	SGNH hydrolase-type protein
5.	Hma2.228466	225	SGNH_hydrolase	SGNH hydrolase-type protein
6.	Hma2.211616	166	Lipase_3	Lipase, class 3 domain protein

Peptidyl-prolyl cis-trans isomerase (6 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.217142	714	cyclophilin_ABH-like	Peptidyl-prolyl cis-trans isomerase protein
2.	Hma2.225963	112	FKBP_C, FKBP-type peptizing-prolyl cis-trans isomerase	Peptidyl-prolyl cis-trans isomerase protein
3.	Hma2.211972	65	FKBP-type peptidyl-prolyl cis-trans isomerase	Peptidyl-prolyl cis-trans isomerase protein
4.	Hma2.205048	120	cyclophilin_ABH-like	cyclophilin_ABH-like protein
5.	Hma2.229629	69	cyclophilin-type peptidylprolyl cis- trans isomerase	cyclophilin-type peptidylprolyl cis- trans isomerase
6.	Hma2.211965	59	Peptidyl-prolyl cis-trans isomerase, cyclophilin-type	cyclophilin-type peptidylprolyl cis- trans isomerase

Protein Disulfide Isomerase (2 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.217925	136	Protein Disulfide Isomerase (PDIa)	Protein Disulfide Isomerase protein
2.	Hma2.220701	113	Protein Disulfide Isomerase (Thioredoxin)	Protein Disulfide Isomerase protein

ADP-ribosyl hydrolase (3 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.225914	668	Rib_hydrolase, ADP-ribosyl cyclase	ADP-ribosyl cyclase protein
2.	Hma2.225918	198	Rib_hydrolase, ADP-ribosyl cyclase	ADP-ribosyl cyclase protein
3.	Hma2.225912	483	Rib_hydrolase, NAD(P)-binding	ADP-ribosyl cyclase protein

ATPase (2 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.203093	356	F1-ATPase_beta	F1-ATPase_beta protein
2.	Hma2.209899	86	ATP-synt_S1, Vacuolar ATP synthase subunit S1	Vacuolar ATP synthase subunit S1 protein/ TM

Rib hydrolase (1 protein)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.225917	106	Rib_hydrolase, ADP-ribosyl cyclase	ADP-ribosyl cyclase protein

Phosphodiesterase / nucleotide pyrophosphatase (3 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.217104	429	Type I phosphodiesterase / nucleotide pyrophosphatase	Phosphodiesterase protein
2.	Hma2.230617	133	Type I phosphodiesterase / nucleotide pyrophosphatase	Phosphodiesterase protein
3.	Hma2.216423	58	3'5'-cyclic nucleotide phosphodiesterase	3'5'-cyclic nucleotide phosphodiesterase

Ungrouped Enzymes (8 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.210882	537	Sulfatase	Arylsulfatase A
2.	Hma2.231407	117	RNase_T2_euk, Ribonuclease T2	Rnase_T2 protein
3.	Hma2.214071	73	Acid_phosphat_A, Histidine acid phosphatase	Acid_phosphat_A, Histidine acid phosphatase
4.	Hma2.206651	642	RelA / SpoT protein (GTP pyrophosphokinase)	RelA / SpoT protein
5.	Hma2.200322	57	Electrontransport oxidoreductase	acyl-Coenzyme A dehydrogenase
6.	Hma2.209499	54	RT_nLTR-like	Reverse Transcriptase
7.	Hma2.210478	540	Sulfatase	Arylsulfatase B related
8.	Hma2.223427	207	F1_ATPase_alpha	F1 ATPase protein

8. Ungrouped Proteins (16 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.220294	81	Ribophorin_II	Ribophorin_II protein
2.	Hma2.208678	363	General transcription factor 2 related Zn finger protein	General Transcription factor 2 related Zn finger protein
3.	Hma2.217685	224	GM2 activator protein (GM2-AP)	GM2 activator protein (GM2-AP) protein
4.	Hma2.207472	132	SOUL heme-binding protein	SOUL heme-binding protein
5.	Hma2.209240	91	Translocon-associated protein, delta subunit precursor (TRAP-delta)	Translocon-associated protein 1
6.	Hma2.234288	54	TRAP_beta	TRAP_beta domain protein
7.	Hma2.212036	95	GM2-AP	GM2 activator protein
8.	Hma2.215378	111	GST_N_Metaxin-like/ Thioredoxin-like fold	GST_N_Metaxin-like protein
9.	Hma2.227465	181	14-3-3 protein	14-3-3 protein
10.	Hma2.223439	401	Eukaryotic porin	Voltage-dependent anion channel 2 related
11.	Hma2.215915	51	Phosphatidylinositol transfer protein	Phosphatidylinositol transfer protein
12.	Hma2.224077	54	Zinc finger, SWIM-type	Zinc finger, SWIM-type protein
13.	Hma2.232227	171	Mito_carr /TM	Solute carrier family 25 protein
14.	Hma2.228538	166	Mito_carr(3)	ADP/ATP-translocator protein
15.	Hma2.205823	57	General TF related Zn finger	General TF related Zn finger
16.	Hma2.221884	54	MADS_MEF2-like (Mef2 myocyte enhancer factor 2)	Mef2 myocyte enhancer factor 2-like protein

9. Contaminants (25 proteins)

Cellular housekeeping enzymes (4 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.226194	59	Hsp90 protein, Histidine kinase-like ATPases	Heat shock protein 90 alpha
2.	Hma2.228992	59	Heat shock protein Hsp90	TNF receptor-associated protein 1 related
3.	Hma2.228164	68	MDH_cytoplasmic_cytosolic, malate dehydrogenases	MDH_cytoplasmic_cytosolic, malate dehydrogenase
4.	Hma2.225097	87	Glyceraldehyde 3-phosphate dehydrogenase	Glyceraldehyde 3-phosphate dehydrogenase

Cytoskeleton & Associated proteins (4 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.208898	454	Actin/actin-like	Actin
2.	Hma2.209092	220	Beta_tubulin	Beta tubulin
3.	Hma2.214514	115	ADF, Actin depolymerisation factor/cofilin-like domains	Actin-binding, cofilin/tropomyosin type protein
4.	Hma2.201478	68	Profilin	Profilin

Histones/ Nuclear proteins (5 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.207221	211	Histone H2A	Histone H2A
2.	Hma2.232238	207	Histone H2B	Histone H2B
3.	Hma2.202246	147	Histone H4	Histone H4
4.	Hma2.223504	133	Histone H2B	Histone H2B
5.	Hma2.219010	51	--	GK Rich Protein/nucleoprotein related

Ribosomal Proteins (6 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.230573	109	Ribosomal protein L11	Ribosomal protein L11
2.	Hma2.233208	94	Ribosomal protein P2	Ribosomal protein 60S
3.	Hma2.223409	85	Ribosomal_L7_archaeal_euk	Ribosomal protein L7, eukaryotic
4.	Hma2.204685	82	40S_S3_KH, K homology RNA-binding (KH), Ribosomal_S3_C	Ribosomal protein S3 with K homology domain
5.	Hma2.202566	52	Ribosomal_S4e, RS4NT	Ribosomal protein S4
6.	Hma2.204686	51	Ribosomal protein L1	60S ribosomal protein L10A

Transposases (2 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.222240	77	Mariner transposase	Mariner transposase
2.	Hma2.221596	69	--	Similar to transposase [Oryzias latipes]

RNA-directed DNA polymerase (4 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.213895	384	RT_nLTR-like	RNA-directed DNA polymerase protein
2.	Hma2.211237	167	RT_nLTR-like	RNA-directed DNA polymerase protein
3.	Hma2.217759	152	RT_nLTR-like	RNA-directed DNA polymerase protein
4.	Hma2.215134	55	--	RT related protein

Supplementary Table 2. Nematocyst shell proteome of *Hydra magnipapillata*.1. Structural Proteins (36 proteins)

Minicollagens and Proline-rich proteins (21 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.216559	54	Poly proline stretch, CRD	CPP-1
2.	Hm-Ncol-1	443	GXY repeat, Proline rich, CRD	Minicollagen-1
3.	Hm-Ncol-2	311	GXY repeat, Proline rich, CRD	Minicollagen-2
4.	Hm-Ncol-3	404	GXY repeat, Proline rich	Minicollagen-3
5.	Hm-Ncol-4	531	GXY repeat, Proline rich	Minicollagen-4
6.	Hm-Ncol-5	1170	GXY repeat, Proline rich, CRD	Minicollagen-5
7.	Hm-Ncol-6	1232	GXY repeat, Proline rich, CRD	Minicollagen-6
8.	Hm-Ncol-7	129	GXY repeat, Proline rich, CRD	Minicollagen-7
9.	Hm-Ncol-8	359	GXY repeat, Proline rich	Minicollagen-8
10.	Hm-Ncol-9	139	GXY repeat, Proline rich	Minicollagen-9
11.	Hm-Ncol-10	305	GXY repeat, Proline rich, CRD	Minicollagen-10
12.	Hm-Ncol-12	224	GXY repeat, Proline rich, CRD	Minicollagen-12
13.	Hm-Ncol-13	417	GXY repeat, Proline rich	Minicollagen-13
14.	Hm-Ncol-14	91	GXY repeat, Proline rich	Minicollagen-14
15.	Hm-Ncol-15	299	GXY repeat, Proline rich, CRD	Minicollagen-15
16.	Hm-Ncol-16	71	GXY repeat, Proline rich, CRD	Minicollagen-16
17.	Hm-Ncol-17	110	GXY repeat, Proline rich, CRD	Minicollagen-17
18.	Hma2.225439	220	Gal-lectin/ SUEL lectin with GXY repeat	Collectin
19.	Hma2.219592	106	GXY repeat	Minicollagen-21
20.	Hma2.231401	202	GXY repeat, CRD	Minicollagen-18
21.	Hma2.228331	51	GXY repeat, coiled-coil, CRD	Minicollagen-20

Other ECM motif proteins (11 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.227746	142	Fibronectin Type II, collagen-binding, Kringle-like fold	Fibronectin Type II -kringle-like domain protein
2.	Hma2.203577	63	TSP1 ⁽²⁾ , Fibronectin type II, collagen-binding, Concanavalin A-like lectin/glucanase, Kringle-like fold	TSP1 Fibronectin domain protein
3.	Hma2.232918	256	Thrombospondin, type 1 repeat	Thrombospondin, type 1 repeat protein / PQ rich protein
4.	Hma2.213810	51	Gal-lectin/ SUEL lectin, CRD	Gal-lectin/ SUEL lectin
5.	Hma2.206417	32	C-Lectin	C-Lectin domain protein
6.	Hma2.226267	373	SCP_GAPR-1, C-Lectin, SEA, CRD	NOWA
7.	Hma2.215621	232	vWFA, SCP_GAPR-1, C-Lectin, CRD	NOWA-like protein
8.	Hma2.211381	74	SEA domain ⁽²⁾ , CRD	SEA domain protein
9.	Hma2.232437	109	vWFA ⁽²⁾ , collagen triple helix ⁽⁷⁾	vWFA domain protein with collagen triple helix
10.	Hma2.206786	92	Pentraxin / LamGL	Geeta protein
11.	Hma2.224520	348	TSP1, Fibrinogen ReD, LamGL	Rajukutty protein

Other Structural Proteins (4 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.209281	95	DKK related Cysteine Domain	DKK-3 family protein
2.	Hma2.230887	61	DKK related Cysteine Domain	DKK-3 family protein
3.	Hma2.228381	71	-	Spinalin
4.	Hma2.213243	55	WD40 repeat-like/LRR kinase 2 related	WD40 repeat-like protein

2. Calcium Binders (4 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.228411	379	MACPF, EGF_Ca	MACPF domain protein
2.	Hma2.213553	120	MACPF, EGF_Ca	MACPF domain protein
3.	Hma2.212260	111	MACPF, EGF_Ca	MACPF, EGF_Ca domain protein
4.	Hma2.211690	70	EGF-like, type 3/ EGF_Ca ⁽⁶⁾	EGF-Ca domain protein

3. Venoms (9 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.227742*	639	Fibronectin Type 2	FN2 domain protein (toxin)
2.	Hma2.210268*	207	Toxin precursor Cnidocyst Hemolysis signal-A-sequence, TM	Toxin precursor
3.	Hma2.224206	169	PLA2_bee_venom-like	PLA2_bee_venom-like protein
4.	Hma2.226192*	220	--	Toxin-A protein
5.	Hma2.221138	218	Toxin precursor cnidocyst hemolysis signal a sequencing/ TM	Toxin precursor protein
6.	Hma2.226366	89	SCP ⁽⁴⁾	Tetra SCP protein
7.	Hma2.226368	88	SCP-like extracellular ⁽²⁾	SCP-like extracellular protein
8.	Hma2.207560	57	SCP_GAPR-1-like, Allergen V5/Tpx-1 related	SCP_GAPR-1-like protein
9.	Hma2.230680	99	WD40, DUF938, Methyltransf_12, Cytosolic fatty-acid binding	WD40 domain protein

* exclusive to Cnidaria

4. Novel Proteins (29 proteins)

Novel proteins type 1 (unique to Nematocyst Proteome) (16 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.203447	572	--	T1NP6
2.	Hma2.231442	516	SR, Scavenger receptor Cys-rich	SR repeat protein/ T1NP8
3.	Hma2.227833	224	--	T1NP9
4.	Hma2.223937	123	Peptidase, cysteine peptidase active site	Putative cysteine peptidase/ T1NP10
5.	Hma2.231441	122	--	sT1NP2
6.	Hma2.209012	113	--	T1NP14
7.	Hma2.220123	95	--	sT1NP21
8.	Hma2.211580	71	--	sT1NP22
9.	Hma2.209218	71	--	sT1NP41
10.	Hma2.223748	69	--	T1NP16
11.	Hma2.232573	69	--	T1NP7
12.	Hma2.202946	66	--	T1NP28
13.	Hma2.227744	60	helix-turn-helix, Psq domain	T1NP12
14.	Hma2.215993	56	--	T1NP17
15.	Hma2.212477	56	--	sT1NP3
16.	Hma2.205574	50	--	sT1NP20

Novel proteins type 2 unique to Hydra (8 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.208161	255	--	sT2NP5
2.	Hma2.210167	237	--	sT2NP3
3.	Hma2.204760	235	--	sT2NP2
4.	Hma2.230175	173	--	T2NP2
5.	Hma2.205649	105	--	sT2NP4
6.	Hma2.211238	73	--	T2NP1
7.	Hma2.228627	56	--	sT2NP1
8.	Hma2.215995	54	--	sT2NP9

Novel proteins type 3 (Unique to Hydra and Nematostella) (2 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.203460	116	-	sT3NP1
2.	Hma2.218440	87	-/CRD	sT3NP2

Novel proteins type 4 (Not unique to Cnidaria) (3 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.232290	133	-	sT4NP2
2.	Hma2.212242	118	-	sT4NP10
3.	Hma2.206027	56	-	sT4NP20

5. Peptidases (5 proteins)

Metallopeptidases (5 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.229432	222	Peptidase_M13_N ⁽²⁾	Peptidase_M13 protein
2.	Hma2.231451	187	Peptidase_M1 ⁽²⁾	Peptidase M1 domain protein
3.	Hma2.230132	105	Peptidase_M13 ⁽²⁾	Peptidase_M13 protein
4.	Hma2.228823	73	Peptidase_M13_N ⁽²⁾	Peptidase_M13 protein
5.	Hma2.233930	57	Peptidase M2 Angiotensin converting enzyme	Peptidase M2 protein

6. Metabolic Enzymes

Carbonic Anhydrases (4 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.201739	234	alpha_Carbonic anhydrase	Carbonic anhydrase VII
2.	Hma2.205404	226	Alpha_CA	Alpha Carbonic Anhydrase protein
3.	Hma2.230311	101	Alpha CA	Alpha Carbonic Anhydrase protein
4.	Hma2.208819	65	Alpha_CA, hAT family dimerisation domain	Alpha Carbonic Anhydrase protein

Glutamate Metabolism (4 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.211598	132	Glutamine amidotransferase (GATase1) domain	Glutamine amidotransferase
2.	Hma2.231813	64	Glutamine amidotransferase (GATase1) domain	Folyl-polygamma-glutamyl hydrolase
3.	Hma2.228945	128	Gamma Glutamyl Transpeptidase	Gamma-glutamyltranspeptidase
4.	Hma2.222066	85	Gamma Glutamyl Transpeptidase	Gamma-glutamyltranspeptidase

Glycoside Hydrolases (1 protein)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.222634	78	Glycoside hydrolase, family 20, Beta-N-acetylhexosaminidase-like	Beta-N-acetyl hexosaminidase-like protein

7. Other Enzymes (3 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.225912	73	Rib_hydrolase,NAD(P)-binding	ADP-ribosyl cyclase protein
2.	Hma2.225914	51	Rib_hydrolase, ADP-ribosyl cyclase	ADP-ribosyl cyclase protein
3.	Hma2.209499	54	RT_nLTR-like	Reverse Transcriptase

8. Ungrouped Proteins (3 protein)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.208678	94	General transcription factor 2 related zinc finger protein	General Transcription factor 2 related Zn finger protein
2.	Hma2.205823	57	General TF related Zn finger	General TF related Zn finger
3.	Hma2.221884	54	MADS_MEF2-like (Mef2 myocyte enhancer factor 2)	Mef2 myocyte enhancer factor 2-like protein

Supplementary Table 3. Shared proteome with HU treated nematocyst-free hydras.

1. Structural Proteins (14 proteins)

ECM motif proteins (5 proteins)

S.No	Model Name	Score	Domains	Annotation
1.	Hma2.208994	67	TSP1 /vWFA domain	Thrombospondin, type I with vWFA domain
2.	Hma2.229042	146	Tetraspanin, extracellular domain or large extracellular loop (LEL), CD9/CD37/CD63 antigen	Tetraspanin, extracellular domain protein
3.	Hma2.217614	965	MAM (14), Fibronectin Type II	MAM domain protein
4.	Hma2.203002	367	Gal_Lectin ⁽⁴⁾ / SUEL lectin	Gal-lectin/ SUEL lectin
5.	Hma2.200137	1915	Carbohydrate-binding WSC	Carbohydrate-binding WSC domain protein

Other Structural Proteins (9 proteins)

S.No	Model Name	Score	Domains	Annotation
6.	Hma2.213345	7641	Myosin motor domain, type II, Myosin_tail_1	Myosin motor domain protein
7.	Hma2.230680	98	WD40, DUF938, Methyltransf_12, Cytosolic fatty-acid binding	WD40 domain protein
8.	Hma2.217561	592	Chitin-binding domain type 2 ⁽⁴⁾	Chitin binding protein
9.	Hma2.229697	153	Chitin_bind_3	Chitin binding protein
10.	Hma2.211682	1129	Fascin-like domain	Fascin-like domain protein (PPOD2 peroxidase)
11.	Hma2.211683	2120	Fascin-like domain	Fascin-like domain protein
12.	Hma2.205478	2771	Fascin-like domain	Fascin-like domain protein
13.	Hma2.214493	227	WD40 domain	WD40 domain protein
14.	Hma2.217613	1260	MAM (15), Trefoil (P-type) ⁽²⁾	Meprin, A5 protein

2. Calcium Modulators (4 proteins)

S.No	Model Name	Score	Domains	Annotation
15.	Hma2.208638	189	MACPF, EGF_Ca	MACPF domain protein
16.	Hma2.211735	2305	Annexin ⁽⁴⁾	Annexin
17.	Hma2.210146	4829	Calcium-binding EF-hand, Aldolase superfamily	Calcium-binding EF-hand protein
18.	Hma2.228383	465	Annexin repeats (4), HMW glutenin	Annexin repeats protein with HMW glutenin domain

3. Venoms (9 proteins)

S.No	Model Name	Score	Domains	Annotation
19.	Hma2.217198	326	ZnMc_astacin-like, ShKT toxin	ShKT toxin domain protein
20.	Hma2.231910	364	SCP_GAPR-1-like	SCP_GAPR-1-like protein
21.	Hma2.219403	1066	EF-hand ⁽²⁾	EF-hand, calcium binding motif protein
22.	Hma2.221233	77	EF-hand ⁽²⁾	EF-hand, calcium binding motif protein
23.	Hma2.220229	223	ZnMc_astacin-like	Zinc Metallopeptidase protein
24.	Hma2.220231	168	Zn_Mc, astacin-like subfamily or peptidase family M12A	Zinc Metallopeptidase protein
25.	Hma2.207911	182	Peptidase M12A, astacin	Peptidase M12A, astacin protein
26.	Hma2.203444	542	Trypsin-like serine protease	Trypsin-like serine protease
27.	Hma2.230838	888	Trypsin-like serine protease domain in C-terminus	Trypsin-like serine protease

4. Novel Proteins (7 proteins)

Novel proteins type 1- unique to nematocyst proteome (5 proteins)

S.No	Model Name	Score	Domains	Annotation
28.	Hma2.215360	1136	--	sT1NP30
29.	Hma2.203001	127	--	sT1NP34
30.	Hma2.231389	680	--	sT1NP38
31.	Hma2.202690	100	--	sT1NP39
32.	Hma2.209593	513	APPLE_Factor_XI-like	sT1NP40

Novel proteins type 2 – exclusive to Hydra (1 protein)

S.No	Model Name	Score	Domains	Annotation
33.	Hma2.215906	922	--	sT2NP8

Novel proteins type 4 - not exclusive to Cnidaria (1 protein)

S.No	Model Name	Score	Domains	Annotation
34.	Hma2.219109	486	--	sT4NP6

5. Peptidases (5 proteins)

Metallopeptidases (3 proteins)

S.No	Model Name	Score	Domains	Annotation
35.	Hma2.231450	216	Peptidase_M1	Peptidase_M1 protein
36.	Hma2.217281	120	ZnMc_MMP, PG_binding_1	Zinc Metallopeptidase protein
37.	Hma2.231451	419	Peptidase_M1 ⁽²⁾	Peptidase M1 domain protein

Serinepeptidases (1 protein)

S.No	Model Name	Score	Domains	Annotation
38.	Hma2.228725	729	Serine carboxypeptidase S28	Peptidase S28 protein

Cysteinepeptidases (1 protein)

S.No	Model Name	Score	Domains	Annotation
39.	Hma2.214055	602	Peptidase_C1A, Inhibitor_I29, Cathepsin propeptide inhibitor domain	Peptidase C1A protein

6. Metabolic Enzymes (5 proteins)

Glycoside hydrolases (2 proteins)

S.No	Model Name	Score	Domains	Annotation
40.	Hma2.212228	1116	GH18_chitolectin_chitotriosidase, Glycoside hydrolase family 18, catalytic domain	Chitinase 1 precursor
41.	Hma2.208934	167	Glyco_hydro_2_C, Glyco_hydro_2_N, Galactose-binding-like	Glucuronidase, beta

Other Carbohydrate-modifying Enzymes (3 proteins)

S.No	Model Name	Score	Domains	Annotation
42.	Hma2.221275	150	Alpha-L-arabinofuranosidase B	Alpha-L-arabinofuranosidase B protein
43.	Hma2.225146	56	AbfB, Alpha-L-arabinofuranosidase B (ABFB) ⁽³⁾	Alpha-L-arabinofuranosidase B
44.	Hma2.221421	1040	FBP_aldolase_I_a, Fructose-1,6-bisphosphate aldolase	Fructose-bisphosphate aldolase, class-I

7. Other Enzymes (9 proteins)

Peptidyl-prolyl cis-trans isomerase (3 proteins)

S.No	Model Name	Score	Domains	Annotation
45.	Hma2.225963	67	FKBP_C, FKBP-type peptizing-prolyl cis-trans isomerase	Peptidyl-prolyl cis-trans isomerase protein
46.	Hma2.211972	178	FKBP-type peptidyl-prolyl cis-trans isomerase	Peptidyl-prolyl cis-trans isomerase protein
47.	Hma2.211965	626	Peptidyl-prolyl cis-trans isomerase, cyclophilin-type	cyclophilin-type peptidylprolyl cis- trans isomerase

ADP-ribosyl hydrolase (1 protein)

S.No	Model Name	Score	Domains	Annotation
48.	Hma2.225914	102	Rib_hydrolase, ADP-ribosyl cyclase	ADP-ribosyl cyclase protein

ATPase (1 protein)

S.No	Model Name	Score	Domains	Annotation
49.	Hma2.203093	2223	F1-ATPase_beta	F1-ATPase_beta protein

Ungrouped Enzymes (4 protein)

S.No	Model Name	Score	Domains	Annotation
50.	Hma2.231407	593	RNase_T2_euk, Ribonuclease T2	Rnase_T2 protein
51.	Hma2.228164	501	MDH_cytoplasmic_cytosolic, malate dehydrogenases	MDH_cytoplasmic_cytosolic malate dehydrogenase
52.	Hma2.200322	51	Electrontransport oxidoreductase	acyl-Coenzyme A dehydrogenase
53.	Hma2.223427	688	F1_ATPase_alpha	F1 ATPase protein

8. Ungrouped Proteins (12 proteins)

S.No	Model Name	Score	Domains	Annotation
54.	Hma2.220294	420	Ribophorin_II	Ribophorin_II protein
55.	Hma2.217685	53	GM2 activator protein (GM2-AP)	GM2 activator protein (GM2-AP) protein
56.	Hma2.207472	216	SOUL heme-binding protein	SOUL heme-binding protein
57.	Hma2.209240	203	Translocon-associated protein, delta subunit precursor (TRAP-delta)	Translocon-associated protein 1
58.	Hma2.234288	314	TRAP_beta	TRAP_beta domain protein
59.	Hma2.212036	153	GM2-AP	GM2 activator protein
60.	Hma2.215378	780	GST_N_Metaxin-like/ Thioredoxin-like fold	GST_N_Metaxin-like protein
61.	Hma2.227465	1292	14-3-3 protein	14-3-3 protein
62.	Hma2.223439	987	Eukaryotic porin	Voltage-dependent anion channel 2 related
63.	Hma2.215915	51	Phosphatidylinositol transfer protein	Phosphatidylinositol transfer protein
64.	Hma2.232227	333	Mito_carr /TM	Solute carrier family 25 protein
65.	Hma2.228538	834	Mito_carr ⁽³⁾	ADP/ATP-translocator protein