Diversity of GH18 family of chitinases in arthropods

Author

1 Supplementary material

Supplementary Materials for Diversity of chitinases GH18 family in arthropods

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4. Genome accessions obtained from NCBI Datasets Database (Table 4).

Other materials:

1. Sequences containing the GH18 domain in arthropods (Supplementary Dataset 1, file `gh18_sequences.csv`).

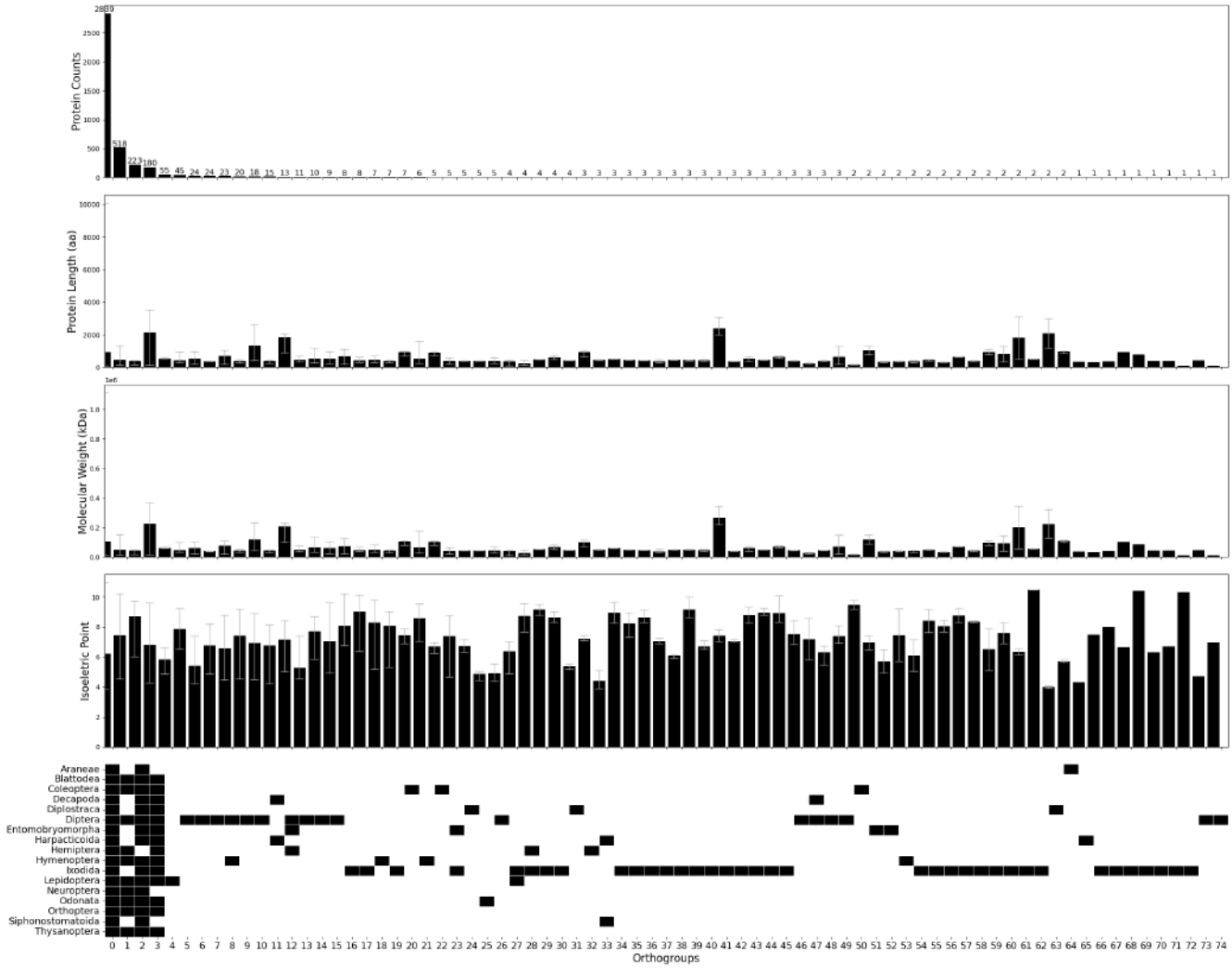

Figure 1: Statistics and Profiles of Orthogroups. The figure provides a comprehensive analysis of sequence characteristics in each orthogroup: number of sequences, average length, average molecular weight, and isoelectric point. The ends of the bars indicate the minimum and maximum values observed. Lastly, the presence profile of arthropod orders in their respective orthogroups.

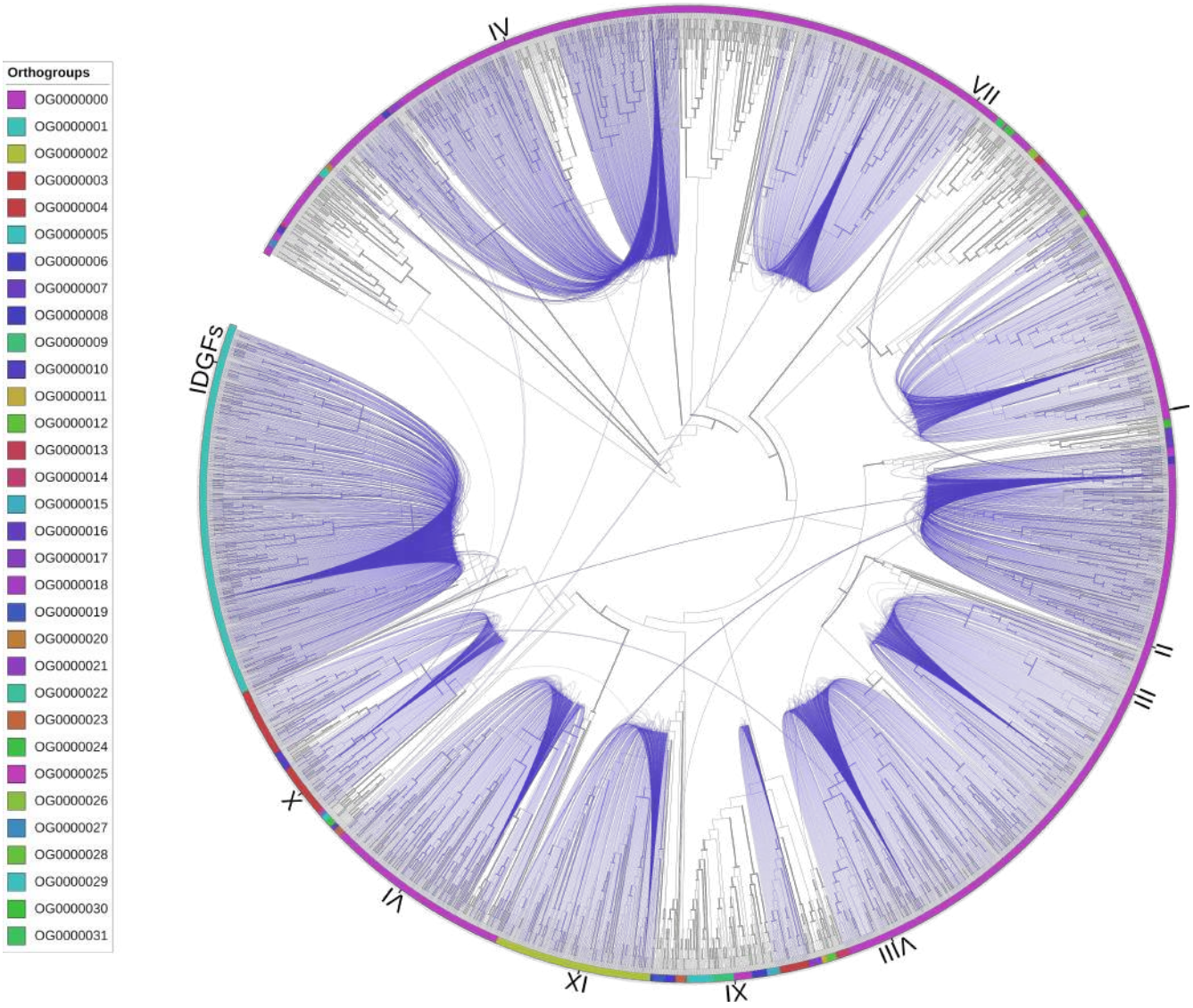

Figure 2: Phylogenetic Analysis of GH18 Chitinases in Arthropods: Identification of Groups, Orthogroups, and Orthologs. Phylogenetic analysis of 4069 sequences containing at least one GH18 domain, distributed into 12 groups and 32 orthogroups. The lines in the figure represent direct connections between chitinase orthologs in *Manduca sexta* (GCF_014839805.1), identified from the OrthoFinder results.

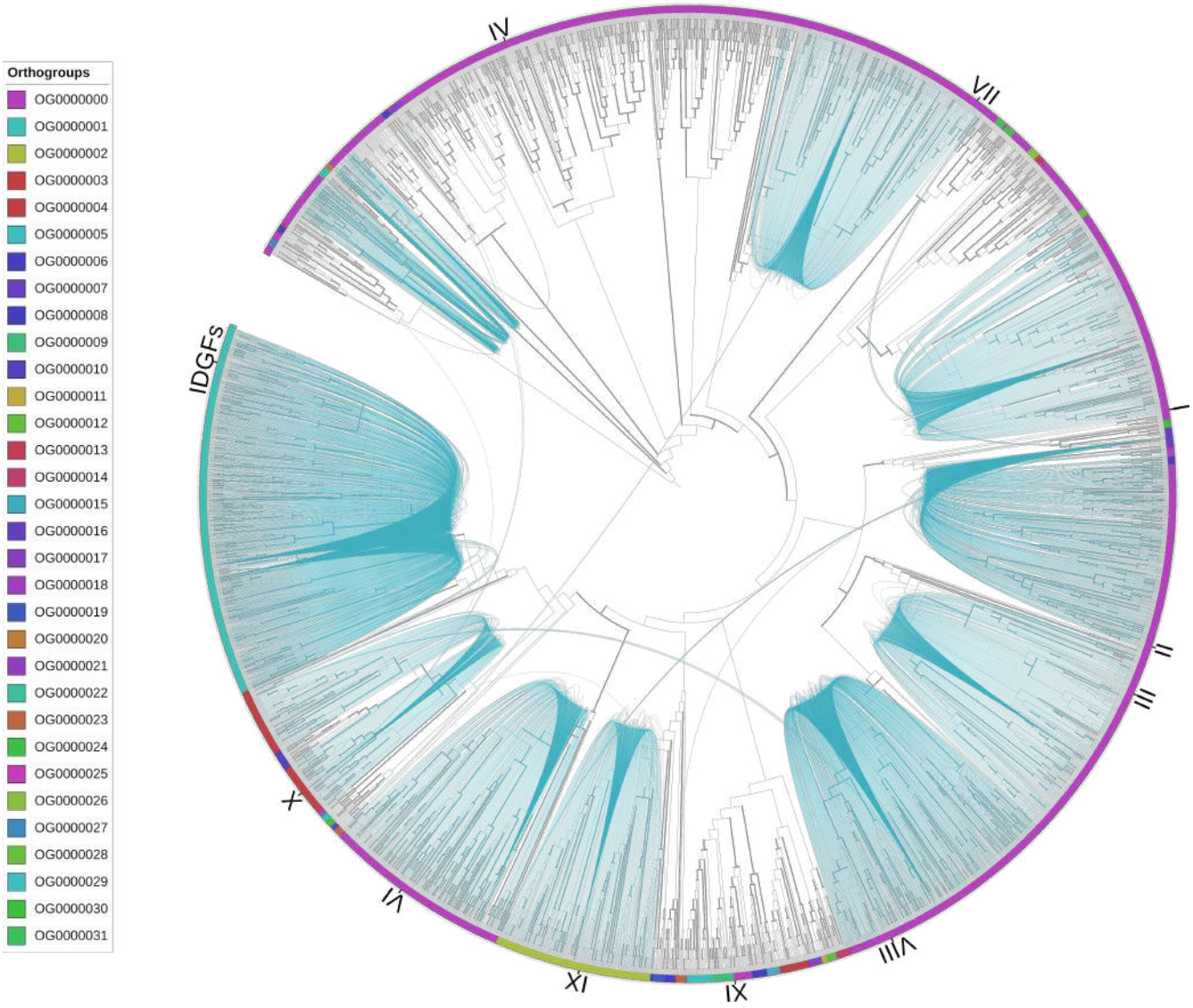

Figure 3: Phylogenetic Analysis of GH18 Chitinases in Arthropods: Identification of Groups, Orthogroups, and Orthologs. Phylogenetic analysis of 4069 sequences containing at least one GH18 domain, distributed into 12 groups and 32 orthogroups. The lines in the figure represent direct connections between chitinase orthologs in *Tribolium castaneum* (GCF_000002335.3), identified from the OrthoFinder results.

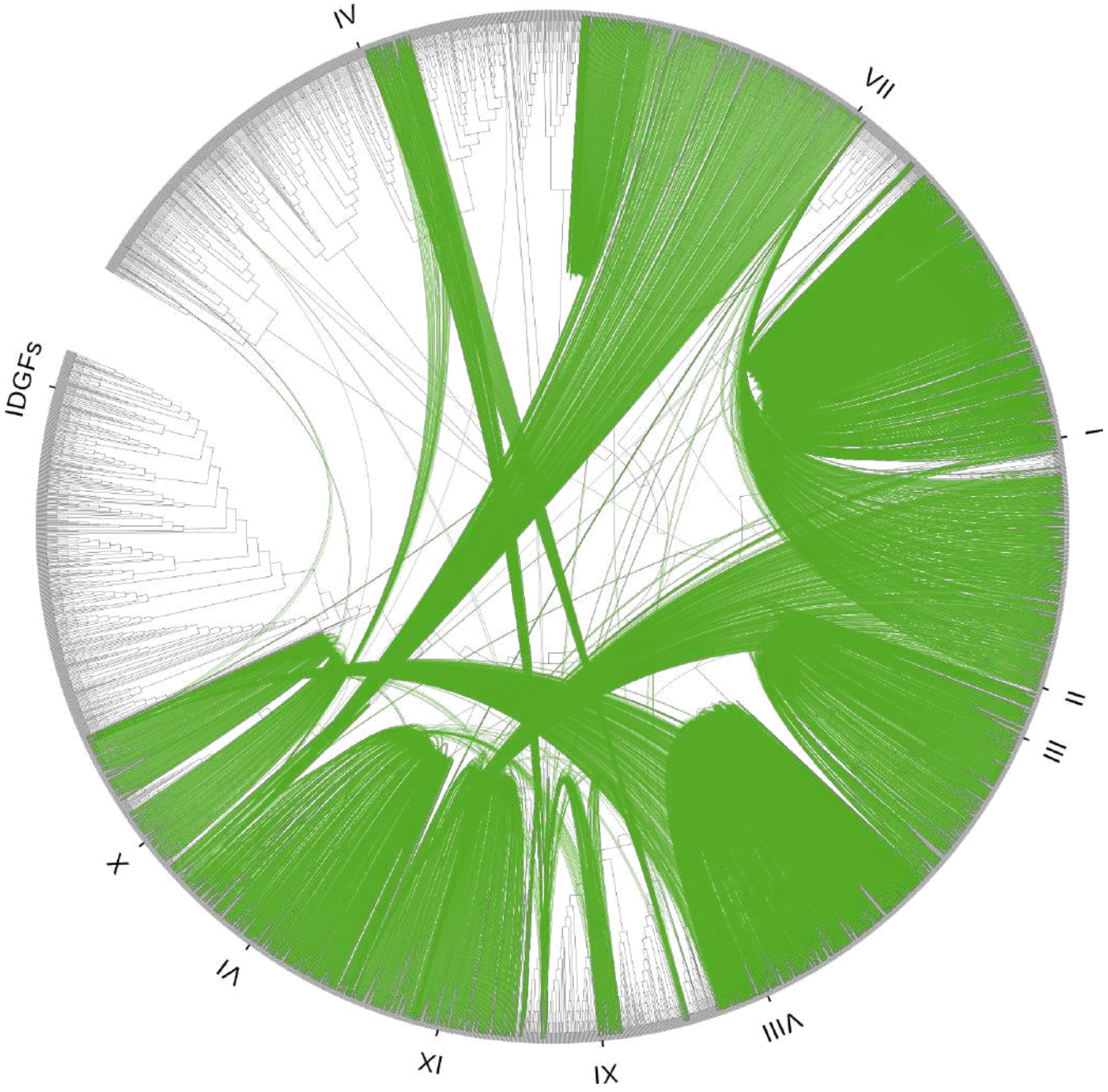

Figure 4: Orthologs of Arthropod Sequences from the Subphylum *Chelicerata*. Phylogenetic tree showing the distribution of GH18 family chitinase orthologs in *Chelicerata*.

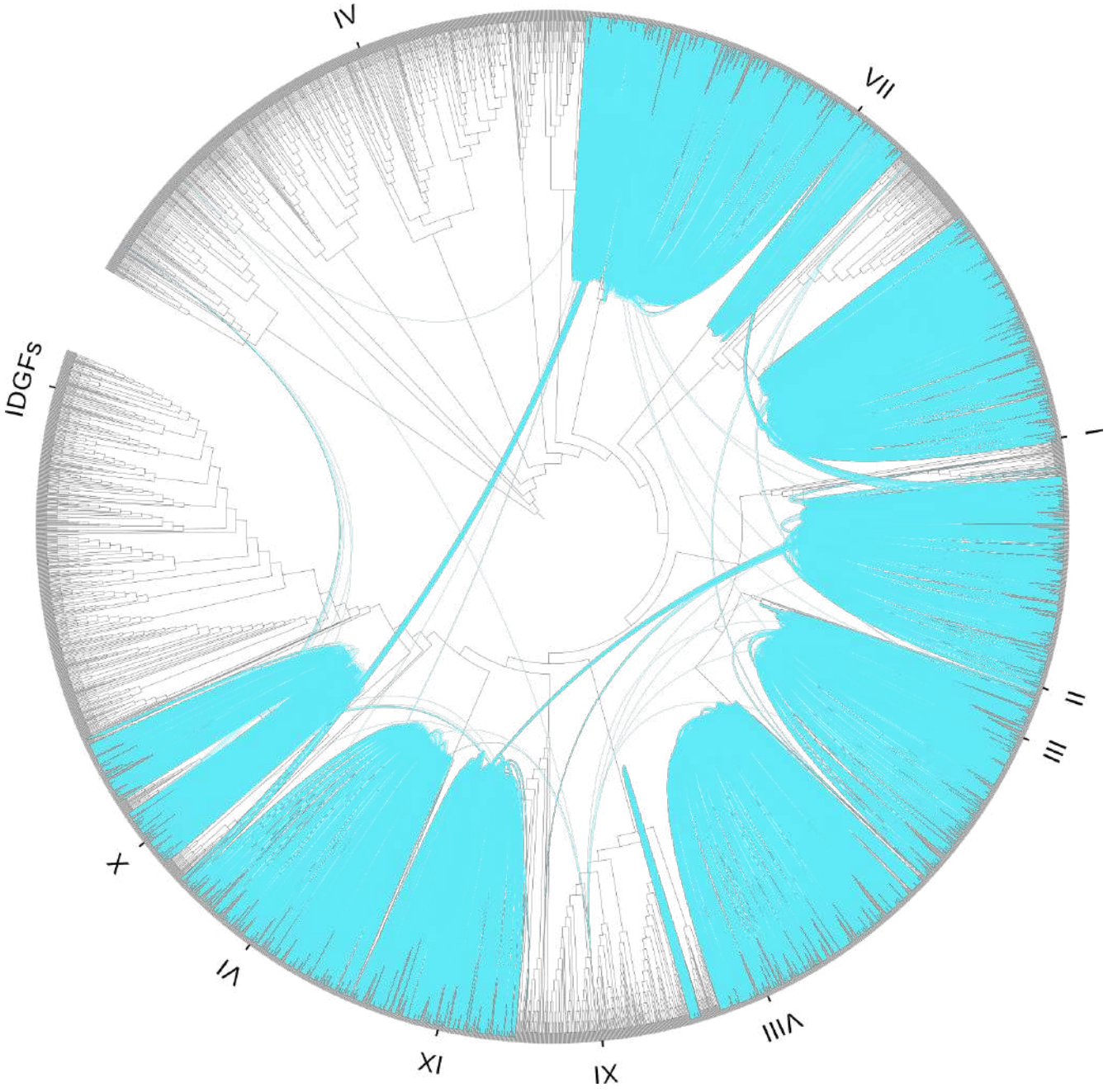

Figure 5: Orthologs of Arthropod Sequences from the Subphylum *Crustacea*.Phylogenetic analysis highlighting the absence of orthologs in Group V (IDGFs) in *Crustacea*

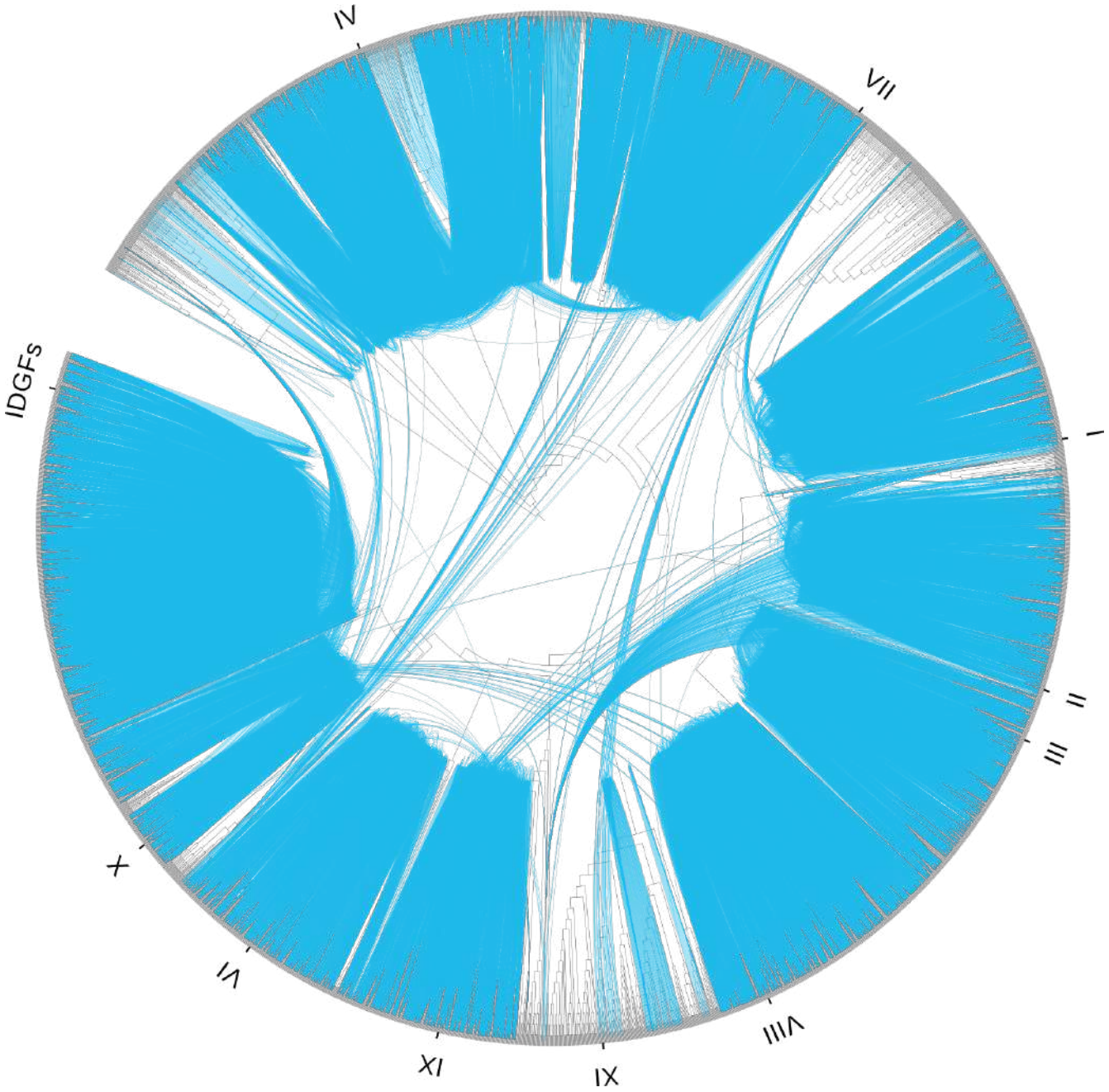

Figure 6: Orthologs of Arthropod Sequences from the Subphylum *Hexapoda*.Phylogeny illustrating the broad diversity of GH18 chitinases in *Hexapoda*, including orthologs across all described groups

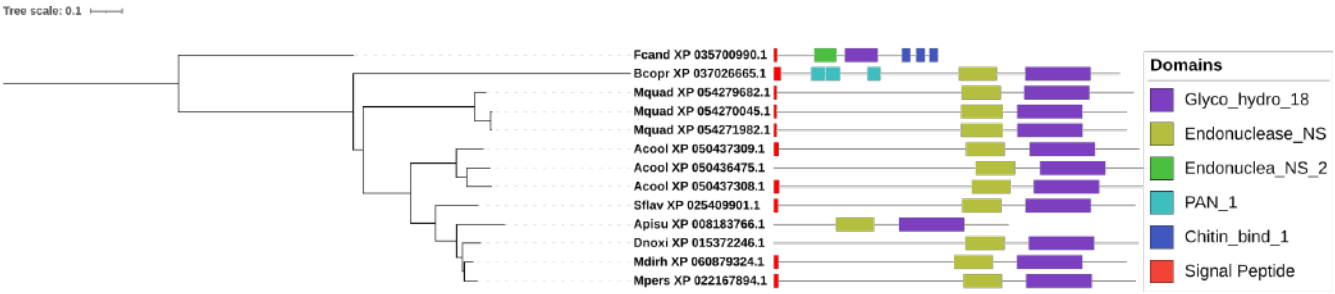

Figure 7: Orthogroup OG0000012. Sequences containing the GH18 catalytic domain (PF00704) combined with the Endonuclease_NS domain (PF01223).

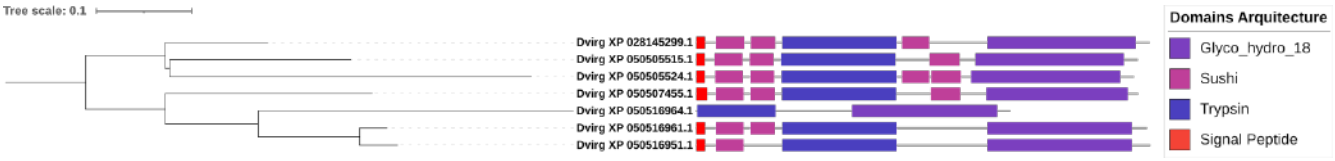

Figure 8: Orthogroup OG0000020. Unique architecture with a signal peptide, Sushi domains (PF00084), Trypsin domain (PF00089), and GH18 domain (PF00704). Exclusive to *Coleoptera*, phylogenetically positioned between Group IV sequences.

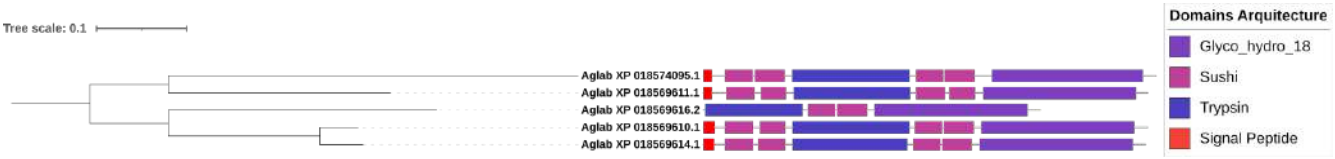

Figure 9: Orthogroup OG0000022. *Coleoptera* sequences with structural organization similar to OG0000020 (Sushi-Trypsin-Sushi-GH18) but with variations in domain arrangement.

Table 1
Sequence Counts by Domain. This table presents the count of unique sequences for each domain identified.

Domains	Number of sequences in which they occur
'CBM_14'	3351
'ChitinaseA_N'	55
'Sushi'	34
'Chitin_bind_1'	15
'Trypsin'	13
'Endonuclease_NS'	13
'LysM'	11
'PH'	7
'Ig_3'	4
'PAN_1'	3
'Collagen'	3
'Kunitz_BPTI'	3
'KRAP_IP3R_bind'	2
'GMC_oxred_C'	2
'Endonuclea_NS_2'	2
'GMC_oxred_N'	2
'Abhydrolase_1'	2
'Hemocyanin_M'	2
'PK_Tyr_Ser-Thr'	2
'T-box'	1
'Pkinase'	1
'CBM_2'	1
'Myb_DNA-bind_4'	1
'DNA_ligase_A_N'	1
'DNA_ligase_A_M'	1
'Cytochrom_B561'	1
'DNA_ligase_A_C'	1
'MFS_1'	1

Table 2
Chitinases in *Drosophila melanogaster* (GCF_000001215.4). The search for identical sequences in the NCBI protein databases was performed using the respective sequence codes from the RefSeq database, corresponding to the genome version used in this study.

Orthogroup	Group	Gene	FlyBase	GenBank	RefSeq
OG0000000	I	Cht5	CG9307	AAF54987.1	NP_650314.1
OG0000000	II	Cht10	CG18140	EAA46011.1	NP_001036422.1
OG0000000	III	Cht7	CG1869	AAF47714.3	NP_647768.3
OG0000000	IV	Cht8	CG9357	AAF46663.2	NP_611542.2
OG0000000	IV	Cht4	CG3986	AAF46664.2	NP_524962.2
OG0000000	IV	Cht9	CG10531	AAF46665.3	NP_611543.3
OG0000001	V	IDGF1	CG4472	AAF53535.1	NP_477258.1
OG0000001	V	IDGF2	CG4475	AAF53536.1	NP_477257.2
OG0000001	V	IDGF3	CG4559	AHN54496.1	NP_001285982.1
OG0000001	V	IDGF4	CG1780	AHN59538	NP_001285068.1
OG0000001	V	IDGF5	CG5154	AAF57703.2	NP_611321.3
OG0000001	V	IDGF6	CG5210	AHN56295.1	NP_001286499.1
OG0000000	VI	Cht6	CG43374	AFH07312.1	NP_001245598.1
OG0000000	VII	Cht2	CG2054	AFH04221	NP_001246550.1
OG0000000	VIII	Cht11	CG3044	AAF46212.1	NP_572361.1
OG0000002	IX	Cht1	CG8460	AAL28794.1	NP_609190.2
OG0000000	IV	Cht12	CG30293	AAM68191.1	NP_726022.1

Table 3
Chitinases in *Tribolium castaneum* (GCF_000002335.3). The search for identical sequences in the NCBI protein databases was performed using the respective sequence codes from the RefSeq database, corresponding to the genome version used in this study.

Orthogroup	Group	Gene	GenBank	RefSeq
OG0000000	I	Cht5	AAV74190.1	NP_001034524.1
OG0000000	II	Cht10	ABG47448.1	NP_001036067.1
			EFA10488.1	XP_008198138.1
OG0000000	III	Cht7	ABG47445.1	NP_001036035.1
			KYB26649.1	XP_973005.1
				XP_015836778.1
			ABG47450.1	NP_001036034.1
			AAW67572.1	NP_001034517.1
			EFA06310.1	
			ABG47449.1	NP_001038095.1
			EFA06696.2	
			AAW67569	NP_001034516.3
OG0000000			EFA06699.2	XP_008195468.1
			EFA06694.1	XP_015836950.1
				XP_015836949.1
			ABG47447.1	NP_001038096.1
			EFA06308.1	
			AAW67570.1	NP_001034515.1
			ABL73927.1	NP_001073567.1
			ABG47446.1	NP_001038094.1
			EFA06693.1	
			ABG47451.1	NP_001038092.1
OG0000001	V	IDGF	ABG47452.1	NP_001038091.1
			EFA03804.1	XP_015835197.1
OG0000000	VI	Cht6	EFA00965.2	XP_008191391.1
OG0000000	VII	Cht2	EFA06923.1	XP_970191.2
OG0000000	VIII	Cht11		XP_015836414.1
			EFA04838.1*	XP_008195024.1*
OG0000002	IX	Cht1	EFA08676.1	XP_971647.1
OG0000003	X	Cht3	EFA08056.1	XP_008197064.1

Table 4

Genome Accessions Obtained from NCBI Datasets Database. This table lists the genome accessions retrieved from the NCBI Datasets Database, including information such as organism order, organism name, abbreviated organism name, assembly accession, and assembly level.

Organism Order	Organism Name	Organism Name Abrev	Assembly Accession	Assembly Level
Araneae	Uloborus diversus	Udive	GCF_026930045.1	Chromosome
Araneae	Argiope bruennichi	Abrue	GCF_947563725.1	Chromosome
Blattodea	Cryptotermes secundus	Csecu	GCF_002891405.2	Scaffold
Blattodea	Zootermopsis nevadensis	Zneva	GCF_000696155.1	Scaffold
Coleoptera	Diorhabda sublineata	Dsubl	GCF_026230105.1	Chromosome
Coleoptera	Anthonomus grandis grandis	Agran	GCF_022605725.1	Chromosome
Coleoptera	Cylas formicarius	Cform	GCF_029955315.1	Scaffold
Coleoptera	Dendroctonus ponderosae	Dpond	GCF_020466585.1	Scaffold
Coleoptera	Tribolium madens	Tmade	GCF_015345945.1	Scaffold
Coleoptera	Onthophagus taurus	Otaur	GCF_000648695.1	Scaffold
Coleoptera	Tribolium castaneum	Tcast	GCF_000002335.3	Chromosome
Coleoptera	Diabrotica virgifera virgifera	Dvirg	GCF_917563875.1	Chromosome
Coleoptera	Aethina tumida	Atumi	GCF_024364675.1	Complete Genome
Coleoptera	Nicrophorus vespilloides	Nvesp	GCF_001412225.1	Scaffold
Coleoptera	Harmonia axyridis	Haxyr	GCF_914767665.1	Chromosome
Coleoptera	Coccinella septempunctata	Csept	GCF_907165205.1	Chromosome
Coleoptera	Agrilus planipennis	Aplan	GCF_000699045.2	Scaffold
Coleoptera	Anoplophora glabripennis	Aglab	GCF_000390285.2	Scaffold
Coleoptera	Photinus pyralis	Ppyra	GCF_008802855.1	Scaffold
Coleoptera	Sitophilus oryzae	Soryz	GCF_002938485.1	Scaffold
Coleoptera	Diorhabda carinulata	Dcari	GCF_026250575.1	Chromosome
Decapoda	Penaeus chinensis	Pchin	GCF_019202785.1	Chromosome
Decapoda	Cherax quadricarinatus	Cquad	GCF_026875155.1	Chromosome
Decapoda	Procambarus clarkii	Pclar	GCF_020424385.1	Chromosome
Decapoda	Penaeus monodon	Pmono	GCF_015228065.2	Chromosome
Decapoda	Eriocheir sinensis	Esine	GCF_024679095.1	Chromosome
Decapoda	Portunus trituberculatus	Ptrit	GCF_017591435.1	Chromosome
Diplostraca	Daphnia carinata	Dcari	GCF_022539665.2	Chromosome
Diplostraca	Daphnia pulex	Dpule	GCF_021134715.1	Chromosome
Diplostraca	Daphnia pulicaria	Dpuli	GCF_021234035.1	Chromosome
Diplostraca	Daphnia magna	Dmagn	GCF_020631705.1	Chromosome
Diptera	Bactrocera latifrons	Blati	GCF_001853355.1	Scaffold
Diptera	Eupeodes corollae	Ecoro	GCF_945859685.1	Chromosome
Diptera	Anopheles bellator	Abell	GCF_943735745.2	Chromosome
Diptera	Drosophila biarmipes	Dbiar	GCF_025231255.1	Chromosome
Diptera	Drosophila sechellia	Dsech	GCF_004382195.2	Chromosome

Table 4 continuation

Organism Order	Organism Name	Organism Name Abrev	Assembly Accession	Assembly Level
Diptera	Anopheles merus	Ameru	GCF_017562075.2	Chromosome
Diptera	Anopheles aquasalis	Aaqua	GCF_943734665.1	Chromosome
Diptera	Drosophila willistoni	Dwill	GCF_018902025.1	Chromosome
Diptera	Drosophila suzukii	Dsuzu	GCF_013340165.1	Chromosome
Diptera	Anopheles stephensi	Astep	GCF_013141755.1	Chromosome
Diptera	Bactrocera oleae	Bolea	GCF_001188975.3	Scaffold
Diptera	Musca domestica	Mdome	GCF_030504385.1	Scaffold
Diptera	Anopheles coustani	Acous	GCF_943734705.1	Chromosome
Diptera	Drosophila mauritiana	Dmaur	GCF_004382145.1	Chromosome
Diptera	Lucilia cuprina	Lcupr	GCF_022045245.1	Chromosome
Diptera	Anopheles funestus	Afune	GCF_943734845.2	Chromosome
Diptera	Anopheles cruzii	Acruz	GCF_943734635.1	Chromosome
Diptera	Stomoxys calcitrans	Scalc	GCF_963082655.1	Chromosome
Diptera	Zeugodacus cucurbitae	Zcucu	GCF_028554725.1	Chromosome
Diptera	Topomyia yanbarensis	Tyanb	GCF_030247195.1	Chromosome
Diptera	Bactrocera tryoni	Btryo	GCF_016617805.1	Chromosome
Diptera	Drosophila subpulchrella	Dsubp	GCF_014743375.2	Chromosome
Diptera	Drosophila pseudoobscura	Dpseu	GCF_009870125.1	Chromosome
Diptera	Culex quinquefasciatus	Cquin	GCF_015732765.1	Chromosome
Diptera	Drosophila teissieri	Dteis	GCF_016746235.2	Chromosome
Diptera	Bactrocera dorsalis	Bdors	GCF_023373825.1	Chromosome
Diptera	Drosophila santomea	Dsant	GCF_016746245.2	Chromosome
Diptera	Drosophila ananassae	Danan	GCF_017639315.1	Chromosome
Diptera	Drosophila busckii	Dbusc	GCF_011750605.1	Chromosome
Diptera	Culex pipiens pallens	Cpipi	GCF_016801865.2	Chromosome
Diptera	Phlebotomus papatasi	Ppapa	GCF_024763615.1	Chromosome
Diptera	Drosophila innubila	Dinnu	GCF_004354385.1	Chromosome
Diptera	Drosophila subobscura	Dsubo	GCF_008121235.1	Chromosome
Diptera	Drosophila simulans	Dsimu	GCF_016746395.2	Chromosome
Diptera	Wyeomyia smithii	Wsmit	GCF_029784165.1	Chromosome
Diptera	Toxorhynchites rutilus septentrionalis	Truti	GCF_029784135.1	Chromosome
Diptera	Malaya genurostris	Mgenu	GCF_030247185.1	Chromosome
Diptera	Anopheles darlingi	Adarl	GCF_943734745.1	Chromosome
Diptera	Bradysia coprophila	Bcopr	GCF_014529535.1	Chromosome
Diptera	Drosophila gunungcola	Dgunu	GCF_025200985.1	Chromosome
Diptera	Drosophila guanche	Dguan	GCF_900245975.1	Scaffold
Diptera	Sabethes cyaneus	Scyan	GCF_943734655.1	Chromosome
Diptera	Drosophila yakuba	Dyaku	GCF_016746365.2	Chromosome
Diptera	Anopheles moucheti	Amouc	GCF_943734755.1	Chromosome

Table 4 continuation

Organism Order	Organism Name	Organism Name Abrev	Assembly Accession	Assembly Level
Diptera	Drosophila nasuta	Dnasu	GCF_023558535.2	Chromosome
Diptera	Anopheles ziemanni	Aziem	GCF_943734765.1	Chromosome
Diptera	Episyrphus balteatus	Ebalt	GCF_945859705.1	Chromosome
Diptera	Drosophila albomicans	Dalbo	GCF_009650485.2	Chromosome
Diptera	Aedes aegypti	Aaegy	GCF_002204515.2	Chromosome
Diptera	Drosophila arizonae	Dariz	GCF_001654025.1	Scaffold
Diptera	Anopheles arabiensis	Aarab	GCF_016920715.1	Chromosome
Diptera	Anopheles coluzzii	Acolu	GCF_943734685.1	Chromosome
Diptera	Drosophila melanogaster	Dmela	GCF_000001215.4	Chromosome
Diptera	Hermetia illucens	Hillu	GCF_905115235.1	Chromosome
Diptera	Anopheles nili	Anili	GCF_943737925.1	Chromosome
Diptera	Ceratitis capitata	Ccapi	GCF_000347755.3	Scaffold
Diptera	Phlebotomus argentipes	Parge	GCF_947086385.1	Scaffold
Diptera	Lutzomyia longipalpis	Llong	GCF_024334085.1	Chromosome
Diptera	Drosophila miranda	Dmira	GCF_003369915.1	Chromosome
Diptera	Anopheles marshallii	Amars	GCF_943734725.1	Chromosome
Diptera	Anopheles gambiae	Agamb	GCF_943734735.2	Chromosome
Diptera	Teleopsis dalmanni	Tdalm	GCF_002237135.1	Chromosome
Diptera	Bactrocera neohumeralis	Bneoh	GCF_024586455.1	Chromosome
Diptera	Anopheles maculipalpis	Amacu	GCF_943734695.1	Chromosome
Diptera	Anastrepha obliqua	Aobli	GCF_027943255.1	Chromosome
Diptera	Uranotaenia lowii	Ulowi	GCF_029784155.1	Chromosome
Diptera	Drosophila navojoa	Dnavo	GCF_001654015.2	Scaffold
Diptera	Anopheles albimanus	Aalbi	GCF_013758885.1	Chromosome
Diptera	Anastrepha ludens	Alude	GCF_028408465.1	Chromosome
Entomobryomorpha	Folsomia candida	Fcand	GCF_002217175.1	Scaffold
Harpacticoida	Tigriopus californicus	Tcali	GCF_007210705.1	Chromosome
Hemiptera	Nilaparvata lugens	Nluge	GCF_014356525.2	Chromosome
Hemiptera	Halyomorpha halys	Hhaly	GCF_000696795.2	Scaffold
Hemiptera	Cimex lectularius	Clect	GCF_000648675.2	Scaffold
Hemiptera	Rhopalosiphum padi	Rpadi	GCF_020882245.1	Chromosome
Hemiptera	Aphis gossypii	Agoss	GCF_020184175.1	Chromosome
Hemiptera	Diuraphis noxia	Dnoxi	GCF_001186385.1	Scaffold
Hemiptera	Sipha flava	Sflav	GCF_003268045.1	Scaffold
Hemiptera	Macrosteles quadrilineatus	Mquad	GCF_028750875.1	Scaffold
Hemiptera	Melanaphis sacchari	Msacc	GCF_002803265.2	Scaffold
Hemiptera	Rhopalosiphum maidis	Rmaid	GCF_003676215.2	Chromosome
Hemiptera	Acyrthosiphon pisum	Apisu	GCF_005508785.2	Chromosome
Hemiptera	Homalodisca vitripennis	Hvitr	GCF_021130785.1	Chromosome

Table 4 continuation

Organism Order	Organism Name	Organism Name Abrev	Assembly Accession	Assembly Level
Hemiptera	Bemisia tabaci	Btaba	GCF_001854935.1	Scaffold
Hemiptera	Daktulosphaira vitifoliae	Dviti	GCF_025091365.1	Scaffold
Hemiptera	Adelges cooleyi	Acool	GCF_023614345.1	Scaffold
Hemiptera	Myzus persicae	Mpers	GCF_001856785.1	Scaffold
Hemiptera	Metopolophium dirhodum	Mdirh	GCF_019925205.1	Chromosome
Hymenoptera	Osmia bicornis bicornis	Obico	GCF_907164935.1	Chromosome
Hymenoptera	Trachymyrmex septentrionalis	Tsept	GCF_001594115.1	Scaffold
Hymenoptera	Bombus vancouverensis nearcticus	Bvanc	GCF_011952275.1	Scaffold
Hymenoptera	Apis laboriosa	Alabo	GCF_014066325.1	Scaffold
Hymenoptera	Habropoda laboriosa	Hlabo	GCF_001263275.1	Scaffold
Hymenoptera	Camponotus floridanus	Cflor	GCF_003227725.1	Scaffold
Hymenoptera	Dufourea novaeangliae	Dnova	GCF_001272555.1	Scaffold
Hymenoptera	Pseudomyrmex gracilis	Pgrac	GCF_002006095.1	Scaffold
Hymenoptera	Chelonus insularis	Cinsu	GCF_013357705.1	Scaffold
Hymenoptera	Bombus affinis	Baffi	GCF_024516045.1	Chromosome
Hymenoptera	Vespa crabro	Vcrab	GCF_910589235.1	Chromosome
Hymenoptera	Apis florea	Aflor	GCF_000184785.3	Scaffold
Hymenoptera	Neodiprion fabricii	Nfabr	GCF_021155785.1	Chromosome
Hymenoptera	Megalopta genalis	Mgena	GCF_011865705.1	Scaffold
Hymenoptera	Hylaeus anthracinus	Hanth	GCF_026225885.1	Scaffold
Hymenoptera	Wasmannia auropunctata	Wauro	GCF_000956235.1	Scaffold
Hymenoptera	Vollenhovia emeryi	Vemer	GCF_000949405.1	Scaffold
Hymenoptera	Colletes gigas	Cgiga	GCF_013123115.1	Scaffold
Hymenoptera	Bombus pascuorum	Bpasc	GCF_905332965.1	Chromosome
Hymenoptera	Acromyrmex echinatior	Aechi	GCF_000204515.1	Scaffold
Hymenoptera	Microplitis demolitor	Mdemo	GCF_026212275.2	Chromosome
Hymenoptera	Megachile rotundata	Mrotu	GCF_000220905.1	Scaffold
Hymenoptera	Trachymyrmex zeteki	Tzete	GCF_001594055.1	Scaffold
Hymenoptera	Cataglyphis hispanica	Chisp	GCF_021464435.1	Chromosome
Hymenoptera	Polistes dominula	Pdomi	GCF_001465965.1	Scaffold
Hymenoptera	Aphidius gifuensis	Agifu	GCF_014905175.1	Chromosome
Hymenoptera	Cotesia glomerata	Cglom	GCF_020080835.1	Chromosome
Hymenoptera	Dinoponera quadriceps	Dquad	GCF_001313825.1	Scaffold
Hymenoptera	Bombus huntii	Bhunt	GCF_024542735.1	Chromosome
Hymenoptera	Formica exsecta	Fexse	GCF_003651465.1	Scaffold
Hymenoptera	Venturia canescens	Vcane	GCF_019457755.1	Chromosome
Hymenoptera	Neodiprion virginianus	Nvirg	GCF_021901495.1	Chromosome
Hymenoptera	Bombus vosnesenskii	Bvosn	GCF_011952255.1	Scaffold
Hymenoptera	Bombus terrestris	Bterr	GCF_910591885.1	Chromosome

Table 4 continuation

Organism Order	Organism Name	Organism Name Abrev	Assembly Accession	Assembly Level
Hymenoptera	Belonocnema kinseyi	Bkins	GCF_010883055.1	Chromosome
Hymenoptera	Odontomachus brunneus	Obrun	GCF_010583005.1	Scaffold
Hymenoptera	Microplitis mediator	Mmedi	GCF_029852145.1	Chromosome
Hymenoptera	Diprion similis	Dsimi	GCF_021155765.1	Chromosome
Hymenoptera	Hylaeus volcanicus	Hvolc	GCF_026283585.1	Chromosome
Hymenoptera	Atta cephalotes	Aceph	GCF_000143395.1	Scaffold
Hymenoptera	Polistes canadensis	Pcana	GCF_001313835.1	Scaffold
Hymenoptera	Neodiprion pinetum	Npine	GCF_021155775.1	Chromosome
Hymenoptera	Apis mellifera	Amell	GCF_003254395.2	Chromosome
Hymenoptera	Bombus pyrosoma	Bpyro	GCF_014825855.1	Chromosome
Hymenoptera	Orussus abietinus	Oabie	GCF_000612105.2	Scaffold
Hymenoptera	Bombus impatiens	Bimpa	GCF_000188095.3	Scaffold
Hymenoptera	Bombus bifarius	Bbifa	GCF_011952205.1	Scaffold
Hymenoptera	Neodiprion lecontei	Nleco	GCF_021901455.1	Chromosome
Hymenoptera	Ooceraea biroi	Obiro	GCF_003672135.1	Chromosome
Hymenoptera	Atta colombica	Acolo	GCF_001594045.1	Scaffold
Hymenoptera	Vespa velutina	Vvelu	GCF_912470025.1	Chromosome
Hymenoptera	Polistes fuscatus	Pfusc	GCF_010416935.1	Scaffold
Hymenoptera	Apis dorsata	Adors	GCF_000469605.1	Scaffold
Hymenoptera	Nasonia vitripennis	Nvitr	GCF_009193385.2	Chromosome
Hymenoptera	Monomorium pharaonis	Mphar	GCF_013373865.1	Chromosome
Hymenoptera	Fopius arisanus	Faris	GCF_000806365.1	Scaffold
Hymenoptera	Athalia rosae	Arosa	GCF_917208135.1	Chromosome
Hymenoptera	Diachasma alloeum	Dallo	GCF_001412515.2	Scaffold
Hymenoptera	Linepithema humile	Lhumi	GCF_000217595.1	Scaffold
Hymenoptera	Solenopsis invicta	Sinvi	GCF_016802725.1	Chromosome
Hymenoptera	Vespula pensylvanica	Vpens	GCF_014466175.1	Chromosome
Hymenoptera	Frieseomelitta varia	Fvari	GCF_011392965.1	Scaffold
Hymenoptera	Pogonomyrmex barbatus	Pbarb	GCF_000187915.1	Scaffold
Hymenoptera	Vespula vulgaris	Vvulg	GCF_905475345.1	Chromosome
Hymenoptera	Apis cerana	Acera	GCF_029169275.1	Chromosome
Ixodida	Rhipicephalus sanguineus	Rsang	GCF_013339695.2	Chromosome
Ixodida	Dermacentor silvarum	Dsilv	GCF_013339745.2	Chromosome
Ixodida	Rhipicephalus microplus	Rmicr	GCF_013339725.1	Chromosome
Lepidoptera	Nymphalis io	Nio	GCF_905147045.1	Chromosome
Lepidoptera	Maniola hyperantus	Mhype	GCF_902806685.1	Chromosome
Lepidoptera	Plodia interpunctella	Pinte	GCF_027563975.1	Chromosome
Lepidoptera	Vanessa cardui	Vcard	GCF_905220365.1	Chromosome
Lepidoptera	Aricia agestis	Aages	GCF_905147365.1	Chromosome

Table 4 continuation

Organism Order	Organism Name	Organism Name Abrev	Assembly Accession	Assembly Level
Lepidoptera	Papilio polytes	Ppoly	GCF_000836215.1	Scaffold
Lepidoptera	Pararge aegeria	Paege	GCF_905163445.1	Chromosome
Lepidoptera	Helicoverpa zea	Hzea	GCF_022581195.2	Chromosome
Lepidoptera	Leptidea sinapis	Lsina	GCF_905404315.1	Chromosome
Lepidoptera	Pectinophora gossypiella	Pgoss	GCF_024362695.1	Chromosome
Lepidoptera	Amyelois transitella	Atran	GCF_032362555.1	Complete Genome
Lepidoptera	Cydia pomonella	Cpomo	GCF_033807575.1	Chromosome
Lepidoptera	Leguminivora glycinivorella	Lglyc	GCF_023078275.1	Chromosome
Lepidoptera	Pieris rapae	Prapa	GCF_905147795.1	Chromosome
Lepidoptera	Pieris brassicae	Pbras	GCF_905147105.1	Chromosome
Lepidoptera	Colias croceus	Ccroc	GCF_905220415.1	Chromosome
Lepidoptera	Zerene cesonia	Zceso	GCF_012273895.1	Chromosome
Lepidoptera	Pieris napi	Pnapi	GCF_905475465.1	Chromosome
Lepidoptera	Vanessa tameamea	Vtame	GCF_002938995.1	Scaffold
Lepidoptera	Maniola jurtina	Mjurt	GCF_905333055.1	Chromosome
Lepidoptera	Papilio machaon	Pmach	GCF_912999745.1	Chromosome
Lepidoptera	Danaus plexippus	Dplex	GCF_018135715.1	Chromosome
Lepidoptera	Spodoptera frugiperda	Sfrug	GCF_023101765.2	Chromosome
Lepidoptera	Helicoverpa armigera	Harmi	GCF_023701775.1	Chromosome
Lepidoptera	Bombyx mori	Bmori	GCF_014905235.1	Chromosome
Lepidoptera	Vanessa atalanta	Vatal	GCF_905147765.1	Chromosome
Lepidoptera	Trichoplusia ni	Tni	GCF_003590095.1	Chromosome
Lepidoptera	Bicyclus anynana	Banyn	GCF_947172395.1	Chromosome
Lepidoptera	Hyposmocoma kahamanoa	Hkaha	GCF_003589595.1	Scaffold
Lepidoptera	Manduca sexta	Msext	GCF_014839805.1	Chromosome
Lepidoptera	Spodoptera litura	Slitu	GCF_002706865.2	Chromosome
Lepidoptera	Plutella xylostella	Pxylo	GCF_932276165.1	Chromosome
Lepidoptera	Melitaea cinxia	Mcinx	GCF_905220565.1	Chromosome
Neuroptera	Chrysoperla carnea	Ccarn	GCF_905475395.1	Chromosome
Odonata	Ischnura elegans	Ieleg	GCF_921293095.1	Chromosome
Orthoptera	Schistocerca serialis cubense	Sseri	GCF_023864345.2	Chromosome
Orthoptera	Schistocerca gregaria	Sgreg	GCF_023897955.1	Chromosome
Orthoptera	Schistocerca cancellata	Scanc	GCF_023864275.1	Chromosome
Orthoptera	Schistocerca piceifrons	Spice	GCF_021461385.2	Chromosome
Orthoptera	Schistocerca americana	Samer	GCF_021461395.2	Chromosome
Orthoptera	Schistocerca nitens	Snite	GCF_023898315.1	Chromosome
Siphonostomatoida	Lepeophtheirus salmonis	Lsalm	GCF_016086655.3	Chromosome
Thysanoptera	Thrips palmi	Tpalm	GCF_012932325.1	Scaffold

Table 4 continuation

Organism Order	Organism Name	Organism Name Abrev	Assembly Accession	Assembly Level
Thysanoptera	Frankliniella occidentalis	Focci	GCF_000697945.3	Scaffold