|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Table S1. Scorpion venom gland transcriptomic analyses. The number of different sequences putatively coding for components of each category is shown per species. Scorpion species are grouped by taxonomic families. An asterisk after the species’ name indicates that the analysis was performed by classical cDNA cloning and Sanger sequencing; otherwise, NGS protocols were used. | | | | | | | | | | | | | | | | | | | | | |
|  | **Species** | | **Transcripts** | **NaTx** | **KTx** | **CaTx** | **ClTx** | **Serine protease** | **Metalloprotease** | **Cysteine protease** | **Phospholipase** | **Hyaluronidase** | **Nucleotidase** | **Protease inhibitor** | **HDP** | **La1-like** | **CAP** | **IGFBP** | **Undefined** | | **Components with no previous report in scorpion venoms** | |
| Buthidae | *Androctonus bicolor \** | | 106 | 26 | 27 | 1 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | |  | |
| *Centruroides hentzi* | | 122 | 36 | 32 | 0 | 0 | 3 | 6 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 5 | 0 | 4 | | Flagellin-c (1); Transferrin superfamily (1); SNARE/SNAP superfamily (1); Cu2+ monooxegenase(1); Headcase superfamily (1); FKBP-C superfamily (1); CBM-14 superfamily (1); LAP-1 (1). | |
| *Centruroides limpidus* | | 198 | 59 | 26 | 0 | 0 | 14 | 24 | 0 | 7 | 1 | 3 | 0 | 17 | 2 | 0 | 0 | 0 | | Alpha amylase (1); Protein-glutamine gamma-glutamyltransferase (1); Inmunoglobulin I-set (1); Sco-spondin (1); Vitellogenin (1); Somatomedin (1). | |
| *Centruroides noxius* | | 72 | 31 | 15 | 2 | 0 | 3 | 7 | 0 | 1 | 1 | 0 | 0 | 11 | 1 | 0 | 0 | 0 | | Colipase (1); toxin-like peptide (1); neurotoxin(2). | |
| *Centruroides tecomanus \** | | 48 | 25 | 7 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 10 | |  | |
| *Hottentotta conspersus \** | | 21 | 3 | 11 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 |  |  |  | 38 | |  | |
| *Hottentotta judaicus \** | | 66 | 22 | 17 | 2 | 1 | 4 | 7 | 0 | 1 | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 9 | |  | |
| *Isometrus maculatus \** | | 60 | 19 | 19 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | |  | |
| *Lychas mucronatus \** | | 56 | 28 | 12 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 17 | 14 | 0 | 9 | 8 | 0 | |  | |
| *Mesobuthus eupeus \** | | 60 | 21 | 15 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 18 | 13 | 1 | 10 | 7 | 10 | |  | |
| *Mesobuthus martensii* | | 108 | 15 | 21 | 1 | 1 | 26 annotated just as enzymes | | | | | | 1 | 3 |  |  |  | 24 | Inhibitor of nitric oxide (NO) synthase (1); meu VNP2 (1). | |
| *Odontobuthus doriae \** | | 38 | 11 | 8 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | |  | |
| *Parabuthus stridulus \** | | 16 | 12 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 15 | 3 | 2 | 0 | 66 | |  | |
| *Tityus bahiensis* | | 170 | 24 | 27 | 0 | 0 | 10 | 36 | 6 | 4 | 3 | 0 | 4 | 11 | 6 | 0 | 0 | 2 | | Chitinase (2); Hypotensin (6); Angiotensin-converting enzyme (4). | |
| *Tityus obscurus* | | 228 | 48 | 33 | 1 | 0 | 12 | 52 | 5 | 8 | 1 | 0 | 0 | 17 | 8 | 0 | 0 | 0 | | Lipase (4); Chitinase (1); amylase (1); neuropeptide-3 (1); Angiotensin-converting enzyme (2). | |
| *Tityus serrulatus* | | 235 | 24 | 23 | 1 |  | 11 | 61 | 5 | 8 | 4 | 0 | 18 | 19 | 5 | 6 | 17 | 1 | | Amylase (1); carbonic anhydrase (1); chitinase (2); lipase (3); neuropeptide-3 (2); putative defense protein 3 (2); Angiotensin-converting enzyme (1); voltage-dependent calcium channel gamma-2 subunit-like (1); voltage-dependent calcium channel type a subunit alpha-1-like (1). | |
| Caraboctonidae | *Hadrurus gertschi \** | | 9 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 6 | 67 | 15 | 0 | 0 | 16 | |  | |
| *Hadrurus spadix* | | 148 | 0 | 32 | 1 | 0 | 5 | 6 | 1 | 3 | 1 | 1 | 2 | 11 | 6 | 7 | 10 | 1 | | Chitinase (1); glyceraldehyde 3-phosphate dehydrogenase (1); C-reactive protein (1); low density lipoprotein receptor (1); Superoxidase dismutase (1); transcetolase (1); Histidin\_phosphatase (1); transferrin (1). | |
| Euscorpiidae | *Scorpiops jendeki \** | | 34 | 0 | 9 | 5 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 2 | 1 | 0 | 14 | | Lysozime (1). | |
| *Scorpiops margerisonae \** | | 43 | 0 | 10 | 1 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 4 | 0 | 0 | 11 | |  | |
| *Megacormus gertschi* | | 182 | 4 | 8 | 7 | 0 | 16 | 36 | 0 | 20 | 5 | 1 | 18 | 19 | 5 | 6 | 17 | 1 | | Lipases (8); Endophilin-B1 (1); leucine-rich repeat-containing protein 15 (1); putative secreted protein (2); HP (3); prothoracicostatic peptide (1); putative vesicle coat complex copii subunit sfb3 (1); HtfTx2 (1). | |
|  | **Species** | | **Transcripts** | **NaTx** | **KTx** | **CaTx** | **ClTx** | **Serine protease** | **Metalloprotease** | **Cysteine protease** | **Phospholipase** | **Hyaluronidase** | **Nucleotidase** | **Protease inhibitor** | **HDP** | **La1-like** | **CAP** | **IGFBP** | **Undefined** | | **Components with no previous report in scorpion venom** | |
| Hemiscorpiidae | *Hadogenes troglodytes \** | | 121 | 0 | 14 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 67 | 15 | 0 | 0 | 16 | |  | |
| *Hemiscorpius lepturus* | | 69 | 0 | 8 | 4 | 0 | 4 | 3 | 0 | 11 | 2 | 0 | 2 | 11 | 6 | 7 | 10 | 1 | |  | |
| *Ophisthacanthus cayaporum \** | | 33 | 0 | 4 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 1 | 6 | 2 | 1 | 0 | 14 | |  | |
| Scorpionidae | *Heterometrus petersii \** | | 57 | 0 | 9 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 10 | 4 | 0 | 0 | 11 | | Acid phosphatase (1); diuretic peptides (1); salivary tick protein (2); cuticule protein (4); other putative secretory proteins (19). | |
| *Heterometrus spinifer* | | 62 | 0 | 9 | 4 | 0 | 16 | 5 | 0 | 7 | 3 | 0 | 11 | 3 | 2 | 0 | 0 | 0 | | Phosphatase (2). | |
| *Pandinus cavimanus \** | | 46 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 3 | 1 | 0 | 0 | 21 | | Hemolectin (1); elastase-like (1); supervillin-like (1); hemocyanine (1); Acyl-CoA reductase, putative (1); NADH dehydrogenase subunit 3 (1); NADH dehydrogenase subunit 6 (1); RNA polymerase II associated protein 2 (1); Cytochrome c oxidase subunit I (1). | |
| *Scorpio maurus palmatus \** | | 11 | 1 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | |  | |
| *Urodacus yaschenkoi* | | 111 | 4 | 10 | 4 | 0 | 5 | 0 | 0 | 18 | 3 | 0 | 7 | 13 | 11 | 3 | 8 | 14 | | Serine-threonine protein phosphatase pp1 beta subunit (2); serine-threonine protein kinase (6); serine beta lactamase (1); carboxylesterase (1); serine-threonine-tyrosine interacting protein (1). | |
| Superstitionidae | *Superstitionia donensis* | | 135 | 8 | 18 | 3 | 0 | 0 | 9 | 0 | 5 | 8 | 0 | 18 | 31 | 7 | 18 | 10 | 0 | |  | |
| Vaejovidae | *Vaejovis mexicanus \** | | 22 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 1 | 0 | 0 | 0 | |  | |
| *Thorellius cristmanus (Syn. Thorellius atrox, Vaejovis intrepidus)* | | 172 | 13 | 21 | 7 | 0 | 18 | 14 | 0 | 21 | 2 | 1 | 24 | 17 | 11 | 8 | 0 | 3 | | Allatostatins-like (1); Ectonucleoside triphosphate diphosphohydrolase 2-like (1); Steryl-sulfatase-like isoform (1); Protein kinase C-binding protein NELL2-like (1); Interferon-induced\_GILT (1); Angiotensin converting enzyme (5). | |
| *Thorellius cristmanus (Syn.Thorellius atrox, Vaejovis intrepidus) \** | | 15 | 1 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 1 |  | 0 | 0 | |  | |
| *Vaejovis subcristatus \** | | 8 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 |  | 0 | 0 | |  | |
| *Vaejovis punctatus \** | | 14 | 2 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 |  | 0 | 0 | |  | |
| *Paravaejovis schwenkmeyeri* | | 146 | 7 | 15 | 6 | 0 | 7 | 5 | 0 | 13 | 2 | 1 | 25 | 25 | 11 | 12 | 9 | 1 | | Leucine rich repeat (3); ATPase function (1); Protein kinase (1); Angiotensin-converting enzyme (5). | |
| *Serradigitus gertschi* | | 119 | 9 | 22 | 6 | 0 | 7 | 9 | 0 | 9 | 3 | 0 | 9 | 17 | 7 | 10 | 11 | 0 | |  | |
|  | Transcripts recovery from all studies | | 3144 | 456 | 510 | 75 | 8 | 155 | 285 | 17 | 143 | 42 | 7 | 226 | 445 | 119 | 115 | 100 | 290 | | Enzymes (74); other proteins (77) | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table S2. High-throughput LC-MS/MS analyses of scorpion venoms. The number of different peptides by category is shown per species. Scorpion species are grouped by taxonomic families. An asterisk after the species’ name indicates that the analysis was performed without a transcriptomic counterpart. | | | | | | | | | | | | | | | | | | | |
|  | **Species** | **Peptides identified** | **NaTx** | **KTx** | **CaTx** | **ClTx** | **Serine protease** | **Metalloprotease** | **Cystein protease** | **Phospholipase** | **Hyaluronidase** | **Nucleotidase** | **Protease inhibitor** | **HDP** | **La1-like** | **CAP** | **IGFBP** | **Undefined** | **Components with no previous report in scorpion venom** |
| Buthidae | *Androctonus bicolor* | 16 | 10 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |  |
| *Centruroides hentzi* | 59 | 27 | 13 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | FKBP-C superfamily (1); GPR; Headcase superfamily (1); Cu2+ monooxegenase (1); SNARE/SNAP superfamily (1); Transferrin superfamily (1); flagellin-C superfamily (1); LAP-1(1), Chitinase (1) |
| *Centruroides limpidus* | 52 | 26 | 3 | 0 | 0 | 1 | 6 | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 2 | 0 | 3 | Alpha amylase (1); Protein-glutamine gamma-glutamyltransferase (1); Inmunoglobulin I-set (1); Sco-spondin (1); Vitellogenin (1); Somatomedin (1) |
| *Tityus metuendus\** | 84 | 28 | 6 | 0 | 0 | 2 | 18 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 3 | 0 | 8 | 40S ribosomal protein S27 (1); arginyltransferase activity (1); Cytochrome b (1); DNA-binding transcription factor activity (1); Glucosamine 6-phosphate N-acetyltransferase (1); glycerophosphocholine cholinephosphodiesterase activity (1); Integrase\_H2C2 domain-containing protein (1); Lysozime (1); NADH dehydrogenase (2); protein kinase activity (1); Angiotensin converting enzyme (2); Aminopeptidase-a (1); carboxypeptidase Q (1) |
| *Tityus serrulatus* | 66 | 8 | 8 | 0 | 0 | 1 | 23 | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 3 | 1 | 2 | Amylase (1); cellular components (15) |
| *Tityus obscurus* | 80 | 3 | 2 | 0 | 0 | 2 | 27 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 4 | Amylase (1); Angiotensin converting enzyme (2); cellular components (34). |
| Caraboctonidae | *Hadrurus spadix* | 79 | 0 | 10 | 0 | 0 | 4 | 6 | 1 | 3 | 1 | 1 | 2 | 4 | 2 | 2 | 0 | 35 | C-reactive protein (1); glyceraldehyde 3-phosphate dehydrogenase (1); histidine phosphatase (1); low density lipoprotein receptor (1); superoxide dismutase (1); transferrin (1); transketolase (1). |
| Euscorpiidae | *Megacormus gertschi* | 23 | 0 | 1 | 0 | 0 | 0 | 9 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 4 | Endophilin-B1 (1); Prothoracicostatic peptide (1); Putative vesicle coat complex copii subunit sfb3 (1). |
| Hemiscorpiidae | *Heterometrus petersii* | 40 | 0 | 9 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 8 | 4 | 0 | 0 | 11 | Acid phosphatase (1); Diuretic peptides(1). |
| Superstitionidae | *Superstitionia donensis* | 26 | 4 | 4 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 8 | 4 | 2 | 0 |  |  |
| Vaejovidae | *Thorellius atrox* | 40 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 4 | 1 | 1 | 0 | 7 | 2 | 2 | 0 | 9 | Allatostatins-like (1); Ectonucleoside triphosphate diphosphohydrolase 2-like (1); Steryl-sulfatase-like isoform (1); Protein kinase C-binding protein NELL2-like (1); Interferon-induced\_GILT (1); Angiotensin converting enzyme (5) |
| *Paravaejovis schwenkmeyeri* | 27 | 0 | 3 | 0 | 0 | 1 | 4 | 0 | 2 | 0 | 1 | 0 | 3 | 1 | 1 | 0 | 6 | Leucine rich repeat (3); ATPase (1); Protein Kinase (1). |
| *Serradigitus gertschi* | 24 | 2 | 2 | 3 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 0 | 4 | 2 | 1 | 0 | 5 |  |
|  | Proteins identified from all studies | 616 | 108 | 67 | 7 | 0 | 16 | 109 | 2 | 18 | 12 | 4 | 3 | 41 | 17 | 22 | 2 | 91 | Enzymes (34), other proteins (75) |