**APPENDIX 2. CHARACTER SCORING**

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| **Character**  **No** | **Character state** | **State No** |
|  | **CARAPACE** |  |
| 0 | Hepatic spine, absent | 0 |
|  | Hepatic spine, present | 1 |
| 1 | Well-developed branchiostegal spine set on anterior margin, absent | 0 |
|  | Well-developed branchiostegal spine set on anterior margin, present | 1 |
| 2 | Rudimentary branchiostegal spine set on anterior margin, absent | 0 |
|  | Rudimentary branchiostegal spine set on anterior margin, present | 1 |
|  | **ABDOMEN** |  |
| 3 | III somite, carina, absent | 0 |
|  | III somite, carina, present | 1 |
| 4 | III somite, a short posteromedian spine, absent | 0 |
|  | III somite, a short posteromedian spine, present | 1 |
| 5 | IV somite, carina, absent | 0 |
|  | IV somite, carina, present | 1 |
| 6 | V somite, carina, absent | 0 |
|  | V somite, carina, present | 1 |
| 7 | VI somite, dorsolateral carina, absent | 0 |
|  | VI somite, dorsolateral carina, present | 1 |
| 8 | VI somite, ventrolateral carina, absent | 0 |
|  | VI somite, ventrolateral carina, present | 1 |
| 9 | VI somite greatly elongate, more than 2.5 times as long as somite V, absent | 0 |
|  | VI somite greatly elongate, more than 2.5 times as long as somite V, present | 1 |
| 10 | VI somite, posteromedian margin not curved upward | 0 |
|  | VI somite, posteromedian margin curved upward | 1 |
|  | **TELSON** |  |
| 11 | Telson apically subtriangular | 0 |
|  | Telson apically truncate | 1 |
| 12 | Dorsolateral spines in addition to apical spines absent | 0 |
|  | Dorsolateral spines in addition to apical spines present | 1 |
| 13 | A single dorsolateral movable spine set near dorsal margin absent | 0 |
|  | A single dorsolateral movable spine set near dorsal margin present | 1 |
| 14 | Triangular enpiece between terminal spines absent | 0 |
|  | Triangular enpiece between terminal spines present | 1 |
| 15 | Three (rarely 2) dorsolateral movable spines along lower margin absent | 0 |
|  | Three (rarely 2) dorsolateral movable spines along lower margin present | 1 |
| 16 | A single dorsolateral movable spine set near ventral margin at about 3/4 of telson length, absent | 0 |
|  | A single dorsolateral movable spine set near ventral margin at about 3/4 of telson length, present | 1 |
|  | **MAXILLIPEDS** |  |
| 17 | Maxilliped I, exopod distally gently not tapering to tip | 0 |
|  | Maxilliped I, exopod distally gently tapering to tip | 1 |
| 18 | Maxilliped I, exopod distally suboval | 0 |
|  | Maxilliped I, exopod distally not suboval | 1 |
| 19 | Maxilliped I, exopod distally not abruptly narrowing to segmented distal part | 0 |
|  | Maxilliped I, exopod distally abruptly narrowing to segmented distal part | 1 |
| 20 | Maxilliped II, merus not significantly expanded more than 3 times as long as broad | 0 |
|  | Maxilliped II, merus greatly expanded, less than 3 times as long as broad | 1 |
| 21 | Maxilliped III, triangular dactylus absent | 0 |
|  | Maxilliped III, triangular dactylus present | 1 |
| 22 | Maxilliped III, subrectangular dactylus absent | 0 |
|  | Maxilliped III, subrectangular dactylus present | 1 |
| 23 | Maxilliped III, unarmed dactylus absent | 0 |
|  | Maxilliped III, unarmed dactylus present | 1 |
| 24 | Maxilliped III, dactilus bearing a single strong spine at tip absent absent | 0 |
|  | Maxilliped III, dactilus bearing a single strong spine at tip present present | 1 |
| 25 | Maxilliped III, dactylus bearing several strong spines at tip absent | 0 |
|  | Maxilliped III, dactylus bearing several strong spines at tip present | 1 |
|  | **PEREOPODS** |  |
| 26 | Pereopods I, a specialized distal tooth of basis absent | 0 |
|  | Pereopods I, a specialized distal tooth of basis present | 1 |
| 27 | Pereopods I, a distal tooth of ischium absent | 0 |
|  | Pereopods I, a distal tooth of ischium present | 1 |
| 28 | Pereopods I, a distal movable spine of merus absent | 0 |
|  | Pereopods I, a distal movable spine of merus present | 1 |
| 29 | Pereopods IV, dactyl entire | 0 |
|  | Pereopods IV, dactyl multiarticulate | 1 |
| 30 | Pereopods V, dactyl entire | 0 |
|  | Pereopods V, dactyl multiarticulate | 1 |
|  | **THELYCUM** |  |
| 31 | S6 entire, with elaborate relief (shields and protuberances) absent | 0 |
|  | S6 entire, with elaborate relief (shields and protuberances) present | 1 |
| 32 | Strong sharp medial tooth on S6 or S8 absent | 0 |
|  | Strong sharp medial tooth on S6 or S8 present | 1 |
| 33 | S6, medial ridge absent | 0 |
|  | S6, medial ridge present | 1 |
| 34 | S6, wide rounded larbrum-like posterior scutum absent | 0 |
|  | S6, wide rounded larbrum-like posterior scutum present | 1 |
| 35 | S6, a pair of posterior setose protuberances absent | 0 |
|  | S6, a pair of posterior setose protuberances present | 1 |
| 36 | S6, large entire posteriorly extended scutum in posterior part absent | 0 |
|  | S6, large entire posteriorly extended scutum in posterior part present | 1 |
| 37 | S7 undivided | 0 |
|  | S7 divided into two parts | 1 |
| 38 | S7 shortened, half as long as S6 | 0 |
|  | S7 not shortened | 1 |
| 39 | S7 as a scutum covered with singular sensory setae absent | 0 |
|  | S7 as a scutum covered with singular sensory setae present | 1 |
| 40 | S7 as a suboval scutum directed forward absent | 0 |
|  | S7 as a suboval scutum directed forward present | 1 |
| 41 | S7 as anteriorly directed scutum with the bat-like anterior profile absent | 0 |
|  | S7 as anteriorly directed scutum with the bat-like anterior profile present | 1 |
| 42 | S7 as anteriorly directed scutum lacking sensory setae absent | 0 |
|  | S7 as anteriorly directed scutum lacking sensory setae present | 1 |
| 43 | S7 with additional posteriorly directed scutum absent | 0 |
|  | S7 with additional posteriorly directed scutum present | 1 |
| 44 | S7 as a simple nearly trapezoid plate absent | 0 |
|  | S7 as a simple nearly trapezoid plate present | 1 |
| 45 | S7, a blunt linguiform protuberance projecting slightly anterior to this segment absent | 0 |
|  | S7, a blunt linguiform protuberance projecting slightly anterior to this segment present | 1 |
| 46 | S7, a sharp protuberance projecting far beyond this segment absent | 0 |
|  | S7, a sharp protuberance projecting far beyond this segment present | 1 |
| 47 | S7, robust setae on posterior margin | 0 |
|  | S7, robust setae on posterior margin | 1 |
| 48 | AS7 entire absent | 0 |
|  | AS7 entire present | 1 |
| 49 | AS7 as two separate structures absent | 0 |
|  | AS7 as two separate structures present | 1 |
| 50 | PS7 extending laterally beyond level of coxae | 0 |
|  | PS7 not extending laterally beyond level of coxae | 1 |
| 51 | PS7 subtriangular/trapezoid, with a narrow part directed forward absent | 0 |
|  | PS7 subtriangular/trapezoid, with a narrow part directed forward present | 1 |
| 52 | PS7 subtriangular, tip directed forward absent | 0 |
|  | PS7 subtriangular, tip directed forward present | 1 |
| 53 | PS7 trapezoid, anteriorly bifid absent | 0 |
|  | PS7 trapezoid, anteriorly bifid present | 1 |
| 54 | PS7 as a narrow transverse crest absent | 0 |
|  | PS7 as a narrow transverse crest present | 1 |
| 55 | PS7 laterally not produced beyong coxae | 0 |
|  | PS7 laterally produced beyong coxae | 1 |
| 56 | PS7 without 2 groups of sublateral setae in addition to 2 groups of sublateral setae | 0 |
|  | PS7 with 2 groups of sublateral setae in addition to 2 groups of sublateral setae | 1 |
| 57 | S8, anteriorly directed scutum absent | 0 |
|  | S8, anteriorly directed scutum present | 1 |
|  | **PETASMA** |  |
| 58 | Petasma: subrectangular | 0 |
|  | Petasma: elongate | 1 |
|  | Petasma greatly elongate | 2 |
| 59 | Petasma, outer margin convex | 0 |
|  | Petasma, outer margin concave | 1 |
| 60 | Petasma, setae on basal part absent | 0 |
|  | Petasma, setae on basal part present | 1 |
| 61 | LA: absent | 0 |
|  | LA: present | 1 |
| 62 | PI, semicircular serrate lamina absent | 0 |
|  | PI, semicircular serrate lamina present | 1 |
| 63 | Petasma, semicircular serrate lamina serrate absent | 0 |
|  | Petasma, semicircular serrate lamina serrate present | 1 |
| 64 | PM elaborate, not divided | 0 |
|  | PM elaborate, divided | 1 |
| 65 | PM as a simple straight lamina absent | 0 |
|  | PM as a simple straight lamina present | 1 |
| 66 | Petasma, PM regularly convex subrectangular | 0 |
|  | Petasma, PM regularly convex greatly elongate | 0 |
| 67 | PM not armed | 1 |
|  | PM armed | 0 |
| 68 | PM not serrate | 1 |
|  | PM serrate | 0 |
| 69 | PM not armed with long lashes | 1 |
|  | PM armed with long lashes | 0 |
| 70 | PM, long lashes in numerous rows absent | 1 |
|  | PM, long lashes in numerous rows present | 0 |
| 71 | PM, do not forming an elaborate grasping structure | 1 |
|  | PM, forming an elaborate grasping structure | 0 |
| 72 | PM, not curved inward | 1 |
|  | PM, curved inward | 0 |
| 73 | PM with rounded apical notch as a bit of a key absent | 1 |
|  | PM with rounded apical notch as a bit of a key present | 0 |
| 74 | Petasma, PE absent | 0 |
|  | Petasma, PE present | 1 |
| 75 | PE not modified | 0 |
|  | PE modified (divided or scoop-like) | 1 |
| 76 | PE without cleft | 0 |
|  | PE modified, deeply cleft | 1 |
| 77 | PE not entire, specialized | 0 |
|  | PE entire, unspecialized | 1 |
| 78 | PE not modified | 0 |
|  | PE modified, shallowly cleft or entire | 1 |