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HAL Authorization

1 ***Macrobrachium ngankeae*, a new species of freshwater shrimp (Crustacea:**
2 **Decapoda: Palaemonidae) from Papua Barat Province, Indonesia**

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4

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23

24 **Abstract**

25 A new freshwater prawn, *Macrobrachium ngankeae* **n. sp.**, is described from two rivers in
26 the Kaimana Regency on the southern coast of Papua Barat Province, Indonesia. The new
27 species belongs to the *Macrobrachium placidulum* (De Man, 1892) species-group, but can be
28 easily distinguished from the other members of this group by having fewer postorbital teeth
29 and the epigastric tooth placed more anteriorly, with a relatively shorter epigastric length, i.e.
30 0.23–0.27 of the carapace length (vs. 0.24–0.55 in the other species). Other distinguishing
31 morphological characters and a molecular analysis of the new species are discussed. A key to
32 the species of the *M. placidulum* species-group is provided.

33

34 **Key words:** Taxonomy, Palaemonidae, new taxon, freshwater prawn, Indonesia, New
35 Guinea, Southeast Asia

36

37 **Introduction**

38

39 In one of the most important early studies on the decapod fauna of the Indo-Malayan archipelago, De
40 Man (1892) described three closely related freshwater prawn species from Indonesia, namely
41 *Macrobrachium lepidactyloides* (De Man, 1892), *M. placidum* (De Man, 1892) and *M. placidulum* (De
42 Man, 1892). Recently, Saeki *et al.* (2018) commented on the taxonomy and the morphology of the *M.*
43 *placidulum* species-group focusing on the Ryukyu Archipelago, providing distinguishing morphological
44 characters for *M. lepidactyloides*, *M. placidum*, *M. placidulum*, *M. feunteuni* Keith & Vigneux, 2002, an
45 endemic species from the Marquesas archipelago (French Polynesia), and an unidentified species
46 reported as *Macrobrachium* sp. According to these authors, species of the *M. placidulum* group are
47 characterized by the distinctly asymmetric male second pereopods and the fingers of the minor cheliped
48 chela widely gaping and covered by dense setae. The chela or (and) the last three pereopods of adult
49 males of the *M. placidulum* species group are densely armed with very characteristic squamiform setae,
50 which appear to represent a synapomorphy for this group.

51 In 2010, the Lengguru-Kaimana Scientific Expedition, a biodiversity survey in Papua Barat
52 Province, was conducted by the Lembaga Ilmu Pengetahuan Indonesia (LIPI) [present: Badan Riset dan
53 Inovasi Nasional (BRIN) = National Research and Innovation Agency], Institut de Recherche pour le
54 Développement (IRD), Akademi Perikanan Sorong (APSOR), the Muséum National d'Histoire
55 Naturelle, Paris (MNHN), Badan Penelitian dan Pengembangan Kelautan dan Perikanan
56 (BALITBANGKP) and Dinas Kelautan dan Perikanan Kaimana (DKP-Kaimana). During this
57 expedition, several specimens of an unidentified species clearly belonging to the *M. placidulum* species
58 group were collected in the southern part of the Papua Barat Province. The purpose of this study is to
59 describe this new species, providing its morphological and molecular identity.

60

61 **Materials and methods**

62

63 **Sample collection, preparation and identification**

64 Specimens were collected from several rivers in the southern part of the Papua Barat (= West
65 Papua) Province, particularly in the Kaimana Regency. The prawns were caught by using an
66 electro-shocker (portable Dekka 3000 electric device, Dekka Ltd, Germany) (Lamarque *et al.*
67 1975). The live specimens were photographed in the field with an Olympus TG-4 camera and

68 later preserved in 75–95% ethanol. Drawings were made using the digital inking method
69 (Coleman 2006) with Adobe Illustrator (CS6). The material examined is deposited in the
70 Museum Zoologicum Bogoriense, Bogor (MZB), Indonesia, and in the Muséum National
71 d’Histoire Naturelle, Paris (MNHN), France. Spine terminology follows Short (2004).
72 Indonesian words used in the text are Ds. or Desa for village; and Sg. or Sungai for river /
73 stream. Other abbreviations used in the text include: asl, above sea level; cl, carapace length
74 (measured from the postorbital margin to the posterior margin of the carapace); E, east; S,
75 south; N, north; W, west; R., river; vs, versus; I., island; Is., islands.

76

77 **DNA extraction, amplification and sequencing**

78 The total DNA was extracted from a tissue sample taken from the last two pairs of the
79 shrimps’ pleopods. The 16S mitochondrial rRNA was amplified by ball PCR (Illustra Hot
80 Start Mix Ready-to-go Protocol), using the primers 16Sa-L
81 (CGCCTGTTTATCAAAAACAT) and 16Sb-H (CTCCGGTTTGAACTCAGATCA) from
82 Palumbi (1996) using a Biorad C1000 Touch Thermal Cycler thermocycler and the following
83 protocol: initial denaturation of 5 min at 94°C, 40 cycles of 30 s denaturation at 94°C, 1 min
84 30 s hybridization at 56°C, 1 min elongation at 72°C, and a final elongation step of 7 min at
85 75°C. The PCR products were visualized by 1.5% agarose gel electrophoresis. The positive
86 PCR products were sequenced in both directions using the Sanger method by the laboratory ©
87 Eurofins France. Chromatograms were then verified and cleaned by eye using MEGA v7.0.26
88 software (Kumar *et al.* 2016).

89

90 **Molecular analyses**

91 DNA sequences were aligned using MEGA X software with Muscle algorithm (Edgar 2004).
92 Using Bayesian information criterion in jModelTest (Guindon & Gascuel 2003; Darriba *et al.*
93 2012) we retained the GTR + G + I model. Best-scoring ML trees were estimated using
94 RAxML HPC2 v.8.2.10 (Stamatakis 2014) and best-scoring Bayesian Inference (BI) trees
95 were estimated using MrBayes v.3.2.7 (Ronquist & Huelsenbeck 2003), both methods
96 implemented in CIPRES with the previously determined model, running for 10,000,000
97 generations, a sampling frequency of 2,000 and a burn in of 10%. Support for nodes was
98 determined using posterior probabilities calculated by MrBayes implemented in the Cyber
99 Infrastructure for Phylogenetic Research (CIPRES) portal v.3.1. (Miller *et al.* 2010;
100 <https://www.phylo.org/>). One hundred independent searches, each starting from distinct

101 random trees, were conducted. Robustness of the nodes was assessed using non-parametric
102 bootstrapping (Felsenstein 1985) with 1,000 bootstrap replicates.

103

104 RESULTS

105 *Molecular results*

106 (Fig. 1)

107 A total of 13 sequences belonging to five species of the *Macrobrachium placidulum* species-
108 group were obtained (plus one sequence retrieved from GenBank for the outgroup). Each
109 species was recovered as a distinct clade. *Macrobrachium feunteuni* (Fig. 1: clade A), was
110 sister to the remainder, with *M. placidum* (Fig. 1: clade B) and *M. placidulum* (Fig. 1: clade
111 C) forming a clades as sister to a moderately supported clade (PP = 0.98; B = 82) clade
112 comprised of the new species (Fig. 1: clade D) and *M. lepidactyloides* (Fig. 1: clade E).

113

114 *Morphological results*

115 The morphological analysis of the specimens (see below) corroborated our molecular results,
116 giving a strong support for recognition of the specimens from Papua Barat as belonging to an
117 undescribed species.

118

119

120 Taxonomy

121

122 Family Palaemonidae Rafinesque, 1815

123

124 *Macrobrachium* Spence Bate, 1868

125

126 *Macrobrachium ngankeae* n. sp.

127 (Figs. 2, 3A)

128

129 **Type material.** INDONESIA. Holotype: male (cl 11.3 mm) (MZB Cru 5350) (DNA:
130 MC1226), Papua Barat Province, Kaimana Regency, Buruway District, Ds. Karawawi, Sg.
131 Kunafa, 04°03.260'S 133°4.742'E, 0–30 m asl, coll. P. Keith, P. Gaucher, G. Ségura, 14
132 October 2010. Paratypes: 1 male (cl 8.2 mm) (MNHN-IU-11859) (DNA: MC1227), same
133 data same as for holotype; 1 male (cl 9.7 mm) (MZB Cru 5351), 1 ovigerous female (cl 8.7
134 mm) (MNHN-IU-2017-9340), Papua Barat Province, Kaimana Regency, Buruway District,

135 Ds. Karawawi, Sg. Kunafa, 77 m asl, coll. P. Keith, P. Gaucher, G. Ségura, 15 October 2010;
136 1 male (cl 9.7 mm) (MNHN-IU-2016-11856), 1 female (cl 9.1 mm) (MZB Cru 5352) (DNA:
137 MC1225), Papua Barat Province, Kaimana Regency, Teluk Etna District, Ds. Kayu Merah,
138 Sg. Kayu Merah, 03°53.290'S 134°28.655'E, coll. P. Keith, P. Gaucher, G. Ségura, 22
139 October 2010.

140 **Type locality.** Kunafa river, 04°03.260'S 133°4.742'E, Kaimana Regency, Papua Barat
141 Province, Indonesia.

142 **Comparative material.** See Supplementary material 1.

143 **Diagnosis.** Small-sized species with subcylindrical body form. Rostrum short, reaching
144 end of second article to end of third article of antennular peduncle; dorsal margin slightly
145 convex, rostral formula: 3–4+6–8/2–3, dorsal teeth equidistantly spaced; first tooth at 0.23–
146 0.27 of carapace length (measured from anterior end). Carapace glabrous. Ocular beak
147 moderately developed. Third maxilliped with exopod shorter than ischiomerus. Second
148 pereopods robust, rather long, dissimilar in shape, unequal in size, covered with squamiform
149 setae. Major second pereopod chela with compressed palm, without setae on cutting edge of
150 fingers, dentate on opposable margins, slightly gaping, fingers shorter than palm, distal part of
151 dactylus and pollex each with double row of tubercles. Cutting edges of minor second
152 pereopod chela gaping, densely covered with long stiff setae concealing surface, fingers as
153 long as to longer than palm. Carpus conical, shorter than chela, shorter than palm, slightly
154 shorter than merus. Third, fourth and fifth pereopods glabrous, with few scattered short stiff
155 setae. T4 with median process. Preanal carina well developed. Uropods glabrous, exopod with
156 mobile mesial spine as long as distolateral tooth. Developed eggs small, maximum size 0.6 by
157 0.5 mm, ovoid, numerous.

158

159 **Description of holotype and paratypes (latter in parenthesis)**

160 Carapace glabrous. Rostrum short, 0.36 cl (0.37–0.43 cl in paratypes), reaching end of
161 second article to end of third article of antennular peduncle (Fig. 2i); moderately slender,
162 maximum depth 0.75 times as maximal dorsoventral diameter of cornea; lateral carina well
163 developed, continuing almost to rostral tip; dorsal carina convex, bent downwards in front of
164 orbit, with tip directed anteriorly, armed with 10 (10–12) equidistantly spaced teeth,
165 interspaces setose, 3 (3–4) teeth completely postorbital, first postorbital tooth on anterior 0.27
166 (0.23–0.26) of carapace; ventral carina convex, with 2 (2–3) teeth, proximal-most tooth
167 located at about distal one-third of rostral length. Inferior orbit margin moderately produced,
168 obtuse; post-antennular carapace margin evenly rounded. Antennal spine sharp, slender,

169 continuing posteriorly as short ridge, situated below lower orbital angle; hepatic spine
170 smaller, situated behind and below antennal spine.

171 Ocular beak moderately developed without expanded lateral tip. Cornea well developed,
172 0.20 cl (0.19–0.22), well pigmented. Epistome (Fig. 2f), bilobed, separated by wide, rather
173 shallow depression anteriorly, lobes with rounded anterior margin.

174 Antennular peduncle 0.45 (0.43–0.51) times as long as carapace. Basal article of
175 peduncle with sharply pointed stylocerite (Fig. 2i), reaching mid-length of second article of
176 peduncle. Scaphocerite (Fig. 2g, i), stout, reaching beyond rostrum, 0.47 (0.48–0.51) of
177 carapace length, 2.53 (2.04–2.80) as long as maximal width maximum breadth, lamina
178 distinctly tapering from widest point to anterior margin, lateral margin straight, mesial margin
179 concave, distolateral tooth reaching end of lamella. Third maxilliped with exopod shorter than
180 ischiomerus. Mouthparts typical of the genus.

181 First pereopods slender, equal in length and similar in form (Fig. 2d), 1.14 cl (1.06–
182 1.33) of carapace length, exceeding scaphocerite by chela and distal half of carpus; fingers
183 0.77 (0.59–0.66) times as long as palm, carpus 1.26 (1.13–1.53) times length of chela, 1.14
184 (1.00–1.34) as long as merus; scattered, short, stiff setae present on chela; scattered, long, stiff
185 setae present on proximal half of merus, and on mesial margin of ischium and basis; other
186 surfaces glabrous.

187 Second pereopods dissimilar in shape and size, robust, covered with squamiform and
188 mammiliform setae, larger and more developed in adult sub-dominant and dominant males
189 than in females.

190 Male major cheliped (Fig. 2a): chela 1.12 (0.83–1.17) of carapace length, 2.70 (1.37–
191 2.83) as long as maximal width, lateral and mesial margins convex; palm compressed, ventral,
192 outer and dorsal margins with flexible, squamiform setae, mesial margin with blunt, stiff,
193 mammiliform setae, setae on mesial margin larger than those on other margins; fingers (Fig.
194 2b) 0.69 (0.63–0.79) times length of palm, slightly gaping, with unguiculate tip; dactylus with
195 3 teeth, increasing in size, at proximal half, followed by unarmed edge ending in a triangular
196 tooth at about two-third from proximal, remaining distal part of dactylus with row of small
197 tubercles on each mesial and lateral cutting edge, margins of dactylus with 2 (2) and 1 (2)
198 tubercles, respectively; cutting edge of pollex with similar armature as that of dactylus], 4
199 teeth at about one-third proximal, largest one most distal, 1 triangular tooth at about half-
200 length of pollex, remaining distal part of pollex with row of small tubercles on each mesial
201 and lateral cutting edge, margins of pollex with 3 (3) and 1 (3) tubercles respectively; palm
202 noticeably longer than maximal width of carpus and merus; chela 2.25 (2.09–2.5) times length

203 of carpus; carpus 0.75 (0.68–0.86) times length of palm, conical, length twice as long (1.69–
204 2.16 times as long), 1.09 (0.92–1.23) times length of merus, merus 1.25 (1.13–1.52) times
205 length of ischium.

206 Male minor cheliped (Fig. 2c, numbers in parenthesis refer to minor cheliped of
207 paratype male, cl 9.7 mm) 0.93 (0.92) as long as major cheliped; chela with margins slightly
208 convex to almost straight; palm cylindrical, lateral margin with few scattered, small, flexible
209 squamiform setae, shorter than those on major chela, mesial margin with minute, blunt, stiff,
210 mammiliform setae, dorsal and ventral margins glabrous (armed with squamiform setae in /
211 on all articles in paratype male, cl 9.7 mm), fingers as long as palm, not gaping, both cutting
212 edges with few tufts of stiff setae (1.49 times length of palm, gaping, both cutting edges with
213 numerous tufts of stiff setae); proximal portion of dactylus with 3 small teeth, proximal
214 portion of pollex with 4 small teeth; palm 4.20 (1.41) times as long as wide; carpus 0.60
215 (0.49) times length of palm, conical, 2.11 (1.83) times as long as wide, 0.30 (0.39) times as
216 long as chela, 0.63 (0.84) times length of merus, merus 1.25 (1.53) times as long as ischium.

217 Female major cheliped with ventral, lateral and dorsal margins densely covered with
218 flexible, squamiform setae, mesial margin with blunt, stiff, mammiliform setae, setae of
219 mesial margin larger than those on other margins; chela 0.86 of carapace length; fingers 0.74
220 times length of palm, not gaping, with unguiculate tip; cutting edge of dactylus with 3 teeth
221 increasing in size distally; cutting edge of pollex with 5 teeth increasing in size distally; palm
222 cylindrical, length 1.76 times of width; carpus long, conical, 0.88 times length of palm, 2.26
223 as long as wide, 0.88 times length of chela, as long as merus; merus 1.61 times length of
224 ischium.

225 Female minor cheliped with same setae organization as major cheliped; chela about as
226 long as chela of major cheliped; fingers 0.70–0.85 times length of palm, both cutting edges
227 densely covered with tufts of stiff setae, unarmed; palm cylindrical, 2.59–2.63 times as long
228 as wide; carpus 0.80–0.87 times length of palm, long, conical or subcylindrical, 2.69–2.81
229 times as long as wide, 0.47 times length of chela, 0.49 times length of merus, merus 1.16–
230 1.23 times as long as ischium.

231 Third pereopod glabrous, with few scattered short stiff setae on all articles; dactylus
232 stout, curved, fringed with setae on dorsolateral surface; propodus 3.12–3.67 times length of
233 dactylus, 6.59–6.77 times as long as wide, with 5–7 spinules along ventral margin of
234 propodus, 2 distal-most spinules paired; carpus 0.53–0.59 times length of propodus; merus
235 1.02–1.05 times length of propodus, 1.89–2.43 times length of ischium. Fifth pereopod (Fig.
236 2e) glabrous, with few scattered, short, stiff setae on all articles; dactylus stout, curved;

237 propodus with a ventrolateral row of setae at distal end, 7.93 (8.34–8.46) times as long as
238 wide, 4.23 (3.63–4.29) times as long as dactylus, with 5–6 spinules along ventral margin of
239 propodus; carpus 0.52 (0.57–0.59) times as long as propodus; merus 0.80 (0.77–1.00) times as
240 long as propodus, 1.72 (1.59–2.48) times as long as ischium.

241 Thoracic sternite 4 with small median process, with distinct submedian plate; thoracic
242 sternite 8 with contagious anterolateral lobes (in fully developed male), with large shallow
243 conical median process.

244

245 Pleon smooth, glabrous; sixth pleonite 1.34 (1.30–1.65) times as long as fifth pleonite.
246 Pleonites of first 2 male sternites each with triangular median process, sloping about 70°;
247 sternite of pleonite 3 unarmed. Inter-uropodal sclerite well developed as large, longitudinal,
248 preanal carina.

249 Telson (Fig. 2h) elongate, 1.46 (1.28–1.88) times as long as sixth pleonite, 3.13 (2.44–
250 3.06) times length of median width; lateral margins straight, convergent posteriorly; dorsal
251 surface with 2 pairs of spines; posterior margin triangular, with large rounded median margin
252 overreached by mesial pair of posterior spines, latter 2.7 longer than lateral pair of spines; 9–
253 13 pairs of long, plumose, subventral setae present between mesial pair spines.

254 Pleopods not especially modified. Endopod of male first pleopod kidney-shaped, with
255 concave mesial margin and convex lateral margin, apex rounded, reaching 0.29–0.41 times
256 total length of endopod. Male second pleopod with appendix masculina long, slender,
257 reaching 0.59 times length of endopod, with numerous simple, stiff setae on anterior margin;
258 appendix interna reaching 0.51 of appendix masculina. Uropods glabrous; exopod with
259 movable spine as long as or longer than distolateral tooth.

260 Oviparous female with numerous, oval-shaped, small-sized eggs (diameter 0.62–0.52
261 mm × 0.42–0.48 mm).

262

263

264 **Life color.** Mainly translucent grey, with mottled pattern of gold-white and darker spots
265 scattered especially on cephalothorax and walking legs; pleon, telson and uropods translucent
266 (Fig. 3A).

267

268

269 **Etymology.** The late Ng Ngan Kee (14 April 1966–5 July 2022) was a leading
270 taxonomist of brachyuran crabs, especially the family Varunidae. She was a good friend and

271 ex-lab mate of the third author (DW), and a very kindhearted person, who always gave her
272 hands whenever people needed her help. The present new species, *Macrobrachium ngankeeae*
273 **n. sp.**, is dedicated to her memory. The specific epithet refers to her first combined name,
274 Ngan Kee, the name by which most of N. K. Ng's colleagues and friends addressed her.
275

276 **Remarks.** Genetic analyses (Fig. 1) and morphological analyses show that
277 *Macrobrachium ngankeeae* sp. nov. belongs to the *M. placidulum* species-group *sensu* Saeki
278 *et al.* (2018). Keith & Vigneux (2002) mentioned that *M. feunteuni* resembles *M.*
279 *lepidactyloides* and both species were also discussed by Saeki *et al.* (2018). Therefore, in the
280 present study, both *M. ngankeeae* **n. sp.** and *M. feunteuni* are included in the *M. placidulum*
281 species-group.

282 Morphological comparisons confirmed that *M. ngankeeae* sp. nov. belongs to the *M.*
283 *placidulum* species-group due to the second pereopods being unequal in length and dissimilar
284 in shape and the presence of squamiform setae on the walking legs.

285 The following characters enable to distinguish the members of this species-group (Table
286 1):

- 287 - Number of post-orbital teeth on the dorsal margin of the cephalothorax (3–4 in *M.*
288 *ngankeeae* sp. nov. *vs.* ≥ 4 for the other four species).
- 289 - Position of the first tooth in proportion of the total cephalothorax length measured
290 from the anterior end (0.23–0.27 in *M. ngankeeae* sp. nov. *vs.* > 0.29 for all except *M.*
291 *feunteuni* (0.24–0.30).
- 292 - Major second pereopod dactylus length compared to palm length: dactylus distinctly
293 shorter than palm in *M. ngankeeae* sp. nov. and *M. placidulum* (*vs.* dactylus shorter to
294 slightly longer than palm in *M. feunteuni* and *M. placidum*, *vs.* dactylus distinctly longer
295 than palm in *M. lepidactyloides*).
- 296 - Major second pereopod chela length compared to carpus length (chela more than 2.3
297 times as long as carpus in *M. ngankeeae* sp. nov., *M. lepidactyloides* (*vs.* chela less
298 than 2.3 times as long as carpus in *M. feunteuni*, *M. placidulum* and *M. placidum*).
- 299 - Minor second pereopod dactylus length compared to palm length (dactylus slightly
300 shorter to longer than palm in *M. ngankeeae* sp. nov., *M. feunteuni* and *M. placidulum*
301 *vs.* slightly shorter to slightly longer in *M. placidum*, *vs.* dactylus considerably longer
302 than palm in *M. lepidactyloides*,
- 303 - Ocular beak (prominent only in *M. ngankeeae* sp. nov.).
- 304 - Projection on the fourth thoracic sternite (present only in *M. ngankeeae* sp. nov.).

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Ecology. *Macrobrachium ngankeae* n. sp. inhabits moderate to fast-flowing rivers in coastal lowlands, at elevation ranging from below 5 to 30 m (Fig. 3B). The number and the size of the eggs in ovigerous females are indicative of a prolonged larval development typical for amphidromous species (Wowor *et al.* 2009).

Distribution. This new species is presently known only from the southern lowlands in Papua Barat Province, Indonesia.

***Macrobrachium feunteuni* Keith & Vigneux, 2002**

Macrobrachium feunteuni Keith & Vigneux, 2002: 130, figs 25–33.

Material examined. See Supplementary material 1.

Diagnosis. Medium-sized species with subcylindrical body form. Rostrum reaching to the middle of the third segment of the antennular peduncle, dorsal margin slightly convex, rostral formula: 5–7+3-4/1–2, Small setae present between teeth of both dorsal and ventral margins. first tooth placed 24.6–30.7 percent of the length of the cephalothorax. Carapace glabrous. Ocular beak moderately developed. Second pereopods robust, dissimilar in shape, unequal in size. The major P2 dactylus bears proximally 3 to 4 rather large teeth, which are placed close together, distally 3 rounded tubercles. The pollex near the articulation with the propodus bears a ridge which consist of 4–8 indistinctly separated, often crenulated teeth, then after an unarmed space a large tooth, distally 8 rounded tubercles. Fingers 0.66–1.03 times as long as palm, chela 1.57–2.33 times as long as carpus. Minor 2nd pereopod with fingers 0.85–1.55 times as long as palm. Cutting edges of minor second pereopod gaping, densely covered with long stiff setae concealing surface. All articles covered with modified squamiform and long blunt mamilliform setae. Third, fourth and fifth pereopods with modified squamiform setae and few scattered short stiff setae. T4 without median process. Preanal carina well developed. Uropods glabrous, exopod with mobile mesial spine longer than distolateral tooth. Developed eggs small, maximum size 0.6 × 0.5 mm, ovoid, numerous.

Distribution. So far *M. feunteuni* is is only encountered in three islands of Marquesas Islands, French Polynesia.

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***Macrobrachium lepidactyloides* (de Man, 1892)**

Palaemon (*Macrobrachium*) *lepidactyloides* De Man, 1892: 497, pl. 29, fig. 51
Palaemon lepidactylus. — Cowles, 1914: 389, pl. 3, Fig. 9 [not *P. lepidactylus* Hilgendorf, 1879.]
Macrobrachium hirtimanus. — Holthuis, 1950: 245 [part], fig. 51a.
Macrobrachium lepidactyloides. — Holthuis, 1952: 210, pl. 15, fig. 2; Chace & Bruce, 1993: 32, fig. 12; Ito *et al.* 2006: 23; Chen *et al.* 2009: 234, tab. 2; Eguia *et al.* 2009: 31; Keith *et al.* 2013: 108; Saeki *et al.* 2018: 35, figs 2–4, 5A–D, 6.

Material examined. See Supplementary material 1.

Diagnosis. Medium-sized species with subcylindrical body form. Rostrum which seldom reaching to the end of the antennular peduncle, dorsal margin slightly convex, rostral formula: 5–7+4–6/2–3, dorsal teeth unequally spaced; first tooth placed 47.3–55.0 percent of the length of the cephalothorax. Carapace glabrous. Ocular beak moderately developed. Second pereopods robust, dissimilar in shape, unequal in size. The Major P2 dactylus bears proximally 2–3 rather large teeth, which are placed close together, distally around 10 smaller triangular teeth. The pollex, near the articulation with the propodus bears a ridge which consist of 2–3 indistinctly separated, often crenulated teeth, then after an unarmed space a large tooth, distally numerous smaller triangular teeth, more than 10. The number of these triangular teeth varies with the length of the fingers. Fingers 1.27–1.33 as long as palm, chela 2.37–2.53 as long as carpus, Minor 2nd pereopod with fingers 1.75–2.12 times as long as palm. Cutting edges of minor second pereopod gaping, densely covered with long stiff setae concealing surface. All articles covered with modified squamiform and long blunt mamilliform setae. Third, fourth and fifth pereopods with modified squamiform setae and few scattered short stiff setae T4 with median process. Preanal carina well developed. Uropods glabrous, exopod with mobile mesial spine longer than distolateral tooth. Developed eggs small, maximum size 0.6 × 0.5 mm, ovoid, numerous.

Distribution. Wide-ranging in the Indo-West Pacific from eastern Indonesia, the Philippines, Taiwan and subtropical Japan to Fiji and French Polynesia.

373 ***Macrobrachium placidulum* (De Man, 1892)**

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375 *Palaemon* (*Macrobrachium*) *placidulus* De Man, 1892: 489, pl. 28, fig. 48.

376 *Macrobrachium placidulum*. — Holthuis, 1950: 253, fig. 51c; Chace & Bruce, 1993: 35, fig.

377 14; Chen *et al.* 2009: 234, tab. 2; Eguia *et al.* 2009: 36; Keith *et al.* 2010: 76; Keith *et al.*

378 2013: 112; Saeki *et al.* 2018: 42, fig. 5E–F, 7

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380 **Material examined.** See Supplementary material 1.

381

382 **Diagnosis.** Medium-sized species with subcylindrical body form. Rostrum short reaching at
383 most to the end of the third segment of the antennular peduncle, mostly to the middle of
384 second segment of the antennular peduncle, dorsal margin slightly convex, rostral formula:
385 4–6+5–7/2–3, dorsal teeth more widely spaced anteriorly than posteriorly; first tooth placed
386 29–50 percent of the length of the cephalothorax. Carapace glabrous. Ocular beak absent or
387 very poorly developed. Second pereopods robust, dissimilar in shape, unequal in size. The
388 major P2 dactylus bears proximally 3–4 rather large teeth, which are well separated, distally
389 seven smaller rounded teeth. The pollex, near the articulation with the propodus bears a ridge
390 which consist of 7 indistinctly separated, often crenulated teeth, then after an unarmed space a
391 large tooth, distally eight smaller rounded teeth.. Fingers 0.55–0.72 times as long as palm,
392 chela 1.64–2.01 times as long as carpus. Minor 2nd pereopod with fingers 1.0–1.29 times as
393 long as palm. Cutting edges of minor second pereopod gaping, densely covered with long
394 stiff setae concealing surface All articles covered with modified squamiform and mamilliform
395 setae. Third, fourth and fifth pereopods with modified squamiform setae and few scattered
396 short stiff setae. T4 without median process. Preanal carina well developed. Uropods
397 glabrous, exopod with mobile mesial spine longer than distolateral tooth. Developed eggs
398 small, maximum size 0.6 × 0.5 mm, ovoid, numerous.

399 **Distribution.** Commonly found in the Indo-West Pacific from south coast of Java to
400 eastern Indonesia, the Philippines, Taiwan and subtropical Japan to Palau, Vanuatu, New
401 Caledonia, Futuna, Fiji and Samoa.

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404 ***Macrobrachium placidum* (de Man, 1892)**

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406 *Palaemon* (*Macrobrachium*) *placidus* De Man, 1892: 483, pl. 28, fig. 46

407 *Macrobrachium placidum*. — Holthuis, 1950: 251, fig. 51b; Chace & Bruce, 1993: 36

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409 **Material examined.** See Supplementarx material 1.

410

411 **Diagnosis.** Medium-sized species with subcylindrical body form. Rostrum short reaching at
412 most to the end of the third segment of the antennular peduncle, mostly to the middle of
413 second segment of the antennular peduncle, dorsal margin slightly convex, rostral formula: 5–
414 7 +4–6/2–4, dorsal teeth more widely spaced anteriorly than posteriorly; first tooth placed 41–
415 50 percent of the length of the cephalothorax. Carapace glabrous. Ocular beak moderately
416 developed. Second pereopods robust, dissimilar in shape, unequal in size. Second pereopods
417 robust, rather long, dissimilar in shape, unequal in size. The major P2 dactylus bears
418 proximally 3 rather large teeth, which are placed close together, then a large tooth followed
419 distally by around 10 smaller triangular teeth. The pollex, near the articulation with the
420 propodus bears a ridge which consist of 4 teeth indistinctly separated, often crenulated teeth,
421 then after an unarmed space a large tooth, distally numerous smaller triangular teeth, more
422 than 10. The number of these triangular teeth varies with the length of the fingers. Fingers
423 0.82–1.02 as long as palm, chela 1.82–2.18 as long as carpus. Minor 2nd pereopod with
424 fingers 0.85–1.1 times as long as palm. Cutting edges of minor second pereopod gaping,
425 densely covered with long stiff setae concealing surface All articles covered with modified
426 squamiform and mamilliform setae. Third, fourth and fifth pereopods with modified
427 squamiform setae and few scattered short stiff setae. T4 without median process. Preanal
428 carina well developed. Uropods glabrous, exopod with mobile mesial spine longer than
429 distolateral tooth. Developed eggs small, maximum size 0.6 × 0.5 mm, ovoid, numerous.

430 **Distribution.** West coast of Sumatra, south coast of Java and southern Sulawesi in
431 Indonesia. This species is recorded for the first time from Catanduanes Island, Philippines.

432

433 **General discussion**

434 *Macrobrachium ngankeae* **n. sp.** belongs, both genetically and morphologically, to the *M.*
435 *placidulum* species group (Fig. 1). According to Saeki *et al.* (2018), this species group is
436 characterized by males having distinctly asymmetric second pereopods and the minor chela
437 fingers widely gaping and densely furnished by setae. The present study suggests that the *M.*
438 *placidulum* group also has several more specific characters, such as the rostrum with at least
439 three teeth behind the orbit; the second pereopods covered by squamiform setae on the
440 dorsal, lateral and ventral margins, and by mamilliform setae on the mesial margin; the

441 preanal carina present and very prominent; the movable spine of the uropodal exopod longer
442 than the distolateral tooth; and ovigerous females with numerous, small-sized, oval eggs,
443 indicating an extended larval development.

444 All members of the *M. placidulum* group are found in the lower to middle course of
445 lowland rivers, where they prefer well-oxygenated zones with strong current. Some specific
446 morphological characters of this species group are related to their adaptation to the habitat (de
447 Mazancourt *et al.* unpub.). For instance, the short and relatively slender rostrum results in less
448 friction in a strong water current (Felgenhauer & Abele, 1983). The squamiform setae, which
449 are present at least on the second cheliped and first walking leg, may represent a
450 hydrodynamic adaptation for swimming in fast flowing environment. Their robust body and
451 stout second chelipeds, with a short and conical carpus, allow them to remain stable in fast-
452 flowing water areas. Each of the last three pairs of pereopods terminate in a stout and have a
453 curved, claw-shaped dactylus, which probably helps the shrimps to have a tighter grip onto
454 the substrate and thus not being swept away by the strong river current. All members of this
455 species group also have a well-developed preanal carina, which is a common feature in
456 moderate to fast flowing dwellers, such as *M. gracilirostre* (Miers) and *M. lar* (Fabricius)
457 (pers. obs.).

458 The number and size of the eggs (developing embryos) suggest that all members of the
459 *M. placidulum* species group are amphidromous species with an extended larval development.
460 The larvae are planktonic and have to develop in a saline environment in estuaries or in the
461 open sea (Wowor *et al.* 2009). The number of the larval development stages, their duration,
462 and the range of salinity tolerance are characteristic for each species (Shokita 1985; Ito *et al.*
463 2006), whereas the sea current pattern significantly contributes to species dispersal (Irving *et*
464 *al.* 2017). As an example, the amphidromous *M. latimanus* (von Martens, 1868) has very wide
465 distribution throughout the Indo-West Pacific, ranging from India and Sri Lanka to Ryukyu
466 Islands in Japan, Marquesas Islands in French Polynesia and reaching the isolated Pitcairn
467 Island (Holthuis 1950; Chace & Bruce 1993; Irving *et al.* 2017). This species has 11 zoeal
468 stages with a total duration of 57 days, and its salinity tolerance ranges between 17.5‰ and
469 28.0‰ (Ito *et al.* 2006). In contrary, the land-locked *M. shokitai* Fujino & Baba, 1973, which
470 is endemic to Iriomote Island in the Ryukyu Islands, Japan (Doi *et al.* 2022), has only one
471 larval stage of 20 hours and no salinity tolerance (Shokita 1985).

472 Among the *M. placidulum* species group members, *M. ngankeeae* **n. sp.** appears to have
473 the most restricted distribution, being presently known only from the southern coast of West
474 Papua Province, Indonesia. However, *M. feunteuni* is also fairly restricted, being found only

475 on three islands of the Marquesas Islands. The remaining three species are more widespread,
 476 with *M. placidum* present from western Sumatra, southern Java and southern Sulawesi in
 477 Indonesia to Catanduanes Island in the Philippines; *M. placidulum* ranging from southern Java
 478 to the eastern islands of Indonesia, Philippines, Taiwan, Ryukyu Islands, Palau, Vanuatu,
 479 New Caledonia, Futuna, Fiji and Samoa; and *M. lepidactyloides* ranging from eastern
 480 Indonesia and the Philippines to Taiwan and Ryukyu Islands in the north, and Fiji and French
 481 Polynesia in the east.

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483 **Key to Species of *Macrobrachium placidulum* species group**

- 484 1 Rostrum with 3–4 postorbital teeth and epigastric length 0.23–0.26 of carapace length
 485 *M. ngankeae*, new species
 486 Rostrum with 4–7 postorbital teeth and epigastric length 0.24–0.55 of carapace length
 4872
 488 2 Rostral dorsal margin above eyes flat and straight *M. feunteuni*
 489 Rostral dorsal margin above eyes convex 3
 490 3 Ocular beak absent or very poorly developed *M. placidulum*
 491 Ocular beak well developed 4
 492 4 T4 without median process *M. placidum*
 493 T4 with median process *M. lepidactyloides*

494

495

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558 **References**

559

560 Chace, F.A. Jr & Bruce, A.J. (1993) The caridean shrimps (Crustacea: Decapoda) of the
561 *Albatross* Philippine Expedition 1907–1910, Part 6: Superfamily Palaemonoidea.
562 *Smithsonian Contributions to Zoology*, 543, i–viii, 1–152.

563 Chen, R-T., Chu, F.T. & Tzeng, W-N. (2009) Freshwater prawns (*Macrobrachium* Bate,
564 1868) of Taiwan with special references to their biogeographical origins and dispersion
565 routes. *Journal of Crustacean Biology*, 29(2), 232–244.

566 Coleman, C.O. (2006). Substituting time-consuming pencil drawings in arthropod taxonomy
567 using stacks of digital photographs. *Zootaxa*, 1360, 61–68.

568 Cowles, R.P. (1914) Palaemons of the Philippine islands. *The Philippine Journal of Science*,
569 (D)9(4), 319–403, fig. 1, pls 1–3

570 Darriba, D., Taboada, G.L., Doallo, R. & Posada, D. (2012). JModelTest 2: More models, new heuristics
571 and parallel computing. *Nature Methods*, 9(8), 772. <https://doi.org/10.1038/nmeth.2109>

572 De Man, J.G. (1892) Decapoden des Indischen Archipels. *In*: Weber, M. (Ed.), *Zoologische*
573 *Ergebnisse einer Reise in Niederländisch Ost-Indien*, 2, 265–527, pls 15–29.

574 Doi, W., Inoue, H. & Kohno, H. (2022) Aspects of distribution, growth, and reproduction of the fluvial
575 prawn, *Macrobrachium shokitai*, in a subtropical river on Iriomote Island, Japan. *Plankton &*
576 *Benthos Research*, 17(2), 192–200. doi: 10.3800/pbr.17.192.

577 Edgar, R.C. (2004). MUSCLE: multiple sequence alignment with high accuracy and high throughput.
578 *Nucleic Acids Research*, 32(5), 1792–1797. <https://doi.org/10.1093/nar/gkh340>

579 Eguia, M.R.R., Dejarne, H.E., Rosario, W.R., Roxas, E.C. & Wowor, D. (2009) Phillipine freshwater
580 prawns (*Macrobrachium* spp.). Tigbauan, Iloilo, Philippines: SEAFDEC Aquaculture Department.
581 *Aquaculture Extension Manual*, 43, 50 pp.

582 Felgenhauer, B.E. & Abele, L.G. (1983) Ultrastructure and functional morphology of feeding and
583 associated appendages in the tropical fresh-water shrimp *Atya innocous* (herbst) with notes on its
584 ecology. *Journal of Crustacean Biology*, 3(3), 336–363.

585 Felsenstein, J. (1985). Phylogenies and the comparative method. *American Naturalist*, 125, 1–15.

586 Guindon, S. & Gascuel, O. (2003) A Simple, fast, and accurate algorithm to estimate large phylogenies
587 by Maximum Likelihood. *Systematic Biology*, 52(5), 696–704.
588 <https://doi.org/10.1080/10635150390235520>

589 Hilgendorf, F. (1879) Die von Hr. W. Peters in Moçambique gesammelten Crustaceen. *Monatsberichte*
590 *der Königlich Preussischen Akademie Wissenschaften zu Berlin*, 1878, 782–852, 1–4 pls.

591 Holthuis, L.B. (1950) The Decapoda of the *Siboga* Expedition, Part X: the Palaemonidae collected by
592 the *Siboga* and *Snellius* Expeditions, with remarks on other species, Part I: Subfamily
593 Palaemoninae. *Siboga-Expeditie*, 39a⁹, 1–268.

594 Holthuis, L.B. (1952) On some Indo-West Pacific Palaemoninae (Crustacea Decapoda Caridea).
595 *Zoologische Mededelingen, Leiden*, 31(18), 201–211, 1 fig, 15 pl.

596 Irving, R.A., Dawson, T.P. & Wowor, D. (2017) An amphidromic prawn, *Macrobrachium latimanus*
597 (von Martens, 1868) (Decapoda: Palaemonidae), discovered on Pitcairn, a remote island in the
598 southeastern Pacific Ocean. *Journal of Crustacean Biology*, 37(4), 503–506.
599 doi:10.1093/jcbiol/rux041.

600 Ito, A., Fujita, Y. & Shokita, S. (2006) Complete larval development of *Macrobrachium latimanus* (von
601 Martens, 1868) (Decapoda: Caridea: Palaemonidae) reared under laboratory conditions.
602 *Crustacean Research*, 35, 1–26.

603 Keith, P., Marquet, G., Gerbeaux, P., Vigneux, E. & Lord, C. (2013) *Poissons et crustacés d'eau douce*
604 *de Polynésie: taxonomie, écologie, biologie et gestion*. Société Française d'Ichtyologie, Paris, 282
605 pp.

606 Keith, P., Marquet, G., Lord, C., Kalfatak, D. & Vigneux, E. (2010) *Poissons et crustacés d'eau douce*
607 *du Vanuatu*. Société Française d'Ichtyologie, Paris, 253 pp.

608 Keith, P. & Vigneux, E. (2002) Revue des Crustacés Atyidae et Palaemonidae d'eau douce de Polynésie
609 Française avec description d'une nouvelle espèce de *Macrobrachium*. *Bulletin Français de la*
610 *Pêche et de la Pisciculture*, 364, 121–145.

611 Kumar, S., Stecher, G., & Tamura, K. (2016) MEGA7: Molecular Evolutionary Genetics Analysis
612 Version 7.0 for Bigger Datasets. *Molecular Biology and Evolution*, 33(7), 1870–1874.
613 <https://doi.org/http://doi.org/10.1093/molbev/msw054>

614 Lamarque, P. (1975). Étude des conditions de la pêche à l'électricité dans les eaux tropicales.
615 *Bulletin du Centre d'Études et de Recherches Scientifiques de Biarritz*, 10(3) 403-554.

616 Miller, M.A., Pfeiffer, W. & Schwartz, T. (2010) Creating the CIPRES Science Gateway for inference
617 of large phylogenetic trees. *In: Proceedings of the Gateway Computing Environments Workshop*
618 *(GCE)*, New Orleans, pp. 1–8. <https://doi.org/https://doi.org/10.1109/GCE.2010.5676129>

619 Palumbi, S.R. (1996) Nucleic acids II: The polymerase chain reaction. *In: Hillis, D.M., Moritz, C. &*
620 *Mable, B.K. (Eds), Molecular Systematics*, 2nd Edition. Sinauer Associates, Inc. Sunderland, MA,
621 pp. 205–247.

622 Ronquist, F., & Huelsenbeck, J.P. (2003) MrBayes 3: Bayesian phylogenetic inference under mixed
623 models. *Bioinformatics*, 19(12), 1572–1574. <https://doi.org/10.1093/bioinformatics/btg180>

624 Shokita, S. (1985) Larval development of the Palaemonid prawn, *Macrobrachium grandimanus*
625 (Randall), reared in the laboratory, with special reference to larval dispersal. *Zoological Science*, 2,
626 785–803.

627 Short, J.W. (2004) A revision of Australian river prawns, *Macrobrachium* (Crustacea: Decapoda:
628 Palaemonidae). *Hydrobiologia*, 525, 1–100.

629 Saeki, T., Maeda, K. & Naruse, T. (2018) Taxonomy and morphology of *Macrobrachium*
630 *placidulum* species-group (Crustacea: Decapoda: Caridea: Palaemonidae) from the
631 Ryukyu Archipelago. *Fauna Ryukuana*, 44, 33-53.

632 Spence Bate, C. (1868) On a new genus, with four spec. nov., of freshwater prawns.
633 *Proceedings of the Zoological Society of London*, 1868, 363–368, pls. 30–31.

634 Stamatakis, A. (2014) RAxML version 8: a tool for phylogenetic analysis and post-analysis of large
635 phylogenies. *Bioinformatics*, 30(9), 1312–1313.
636 <https://doi.org/http://doi.org/10.1093/bioinformatics/btu033>

637 Wowor, D., Muthu, V., Meier, R., Balke, M., Cai, Y. & Ng, P.K.L. (2009) Evolution of life history traits
638 in Asian freshwater prawns of the genus *Macrobrachium* (Crustacea: Decapoda: Palaemonidae)
639 based on multilocus molecular phylogenetic analysis. *Molecular Phylogenetics and Evolution*,
640 52(2), 340–350.

641

642 **Legends to figures**

643 **FIGURE 1.** Phylogenetic Bayesian 16S tree of *Macrobrachium placidulum* species-group.
644 Numbers above branches are Bayesian posterior probabilities, numbers under branches are
645 bootstrap values.

646 **FIGURE 2.** *Macrobrachium ngankeeae* n. sp., paratype: male (cl 9.7 mm) (MNHN-IU-2016-
647 11856), Papua Barat Province. a, major second pereopod; b, major second pereopod finger;
648 c, minor second pereopod; d, first pereopod; e, fifth pereopod; f, epistome; g, scaphocerite;
649 h, telson; i, cephalothorax.

650 **FIGURE 3.** A, Living male specimen of *Macrobrachium ngankeeae* sp. nov.; B, typical
651 habitat of *M. ngankeeae* sp. nov. (photos by P. Keith).

652 **TABLE 1.** Morphological comparison of the species of the *M. placidulum* species-group.