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# Two new species of blue-eyed *Trimma* (Pisces; Gobiidae) from New Guinea

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## Abstract

Two new species of *Trimma* are described from New Guinea, one at the southeastern end at Normanby Island (Milne Bay Province), the other from Cendrawasih Bay, West Papua, on the north-east coast. The dorsal surface of the eye of both species is blue in life, a characteristic not reported elsewhere in the genus. Although the two species look very similar in life, and both occupy similar mesophotic rubble habitats in the 50-70 m depth range, they are separated both genetically (7.7% pairwise genetic distance in COI) and morphologically. *Trimma blematium* has 16 pectoral fin rays, a branched 5th pelvic fin ray, and 7 papillae in row *p*, whereas *T. meityae* has 17–18 pectoral fin rays, an unbranched 5th pelvic fin ray, and 8 papillae in row *p*. In live specimens, the blue colour over the top of the eyes is much darker in *T. blematium* than in *T. meityae*. The type localities are separated by almost 2,000 km (straight-line distance).

**Key words:** taxonomy, Western Pacific, coral reef gobies, COI gene

## Introduction

*Trimma* Jordan & Seale, 1906 (type species: *T. caesiura* Jordan & Seale, 1906) currently contains 101 valid described species of small (<30 mm SL), often colourful gobiids, primarily associated with Indo-Pacific coral reefs. Members of the genus may be recognized by the lack of cephalic sensory canal pores, a much reduced cephalic sensory papillae pattern, a wide gill opening extending anteriorly to below the vertical limb of the preopercle or, more usually, anterior to this, a lack of spicules (odontoids) on the outer gill rakers of the first gill arch, fewer than 12 dorsal and anal fin rays, and a fifth pelvic-fin ray that is equal to or more than 40% the length of the fourth pelvic fin ray (Winterbottom, 2011).

Winterbottom (2011, citing unpublished data) estimated that there were, at that time, about 35 known, but currently undescribed species in the genus, for a total count in the vicinity of 110 species. However, recent research involving the COI gene suggests that there may be a plethora of cryptic species in the genus that could double this number (Winterbottom *et al*., 2014b), depending, in part, on whether one accepts a >2% difference in the COI gene as representative of specific differentiation in these fishes, and whether any correlated morphological characters can be found. In addition, collections made below normal scuba diving depths (ca. 50 m) almost always contain previously unknown species. A further complication is that species that appear to be identical in the field may prove to be distinct species when new evidence is applied.

## Methods

All specimens were collected using regular scuba gear and clove oil (anaesthetic). Methods of gathering data and the format of the descriptions follow Winterbottom (2016, and references cited therein). Naming of the cephalic sensory papillae rows follows Winterbottom (2011), as modified by Winterbottom *et al*. (2015). Lengths given are Standard Length (SL) in millimeters; values for the holotype are in bold and the mean and number of specimens

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used is given in parentheses where appropriate. Abbreviations for repositories of material examined follow the codon abbreviations published by the American Society of Ichthyologists and Herpetologists (http://www.asih.org/resources). Counts and measurements were input directly into an Excel file with Mitutoyo digital calipers using WinWedge 3.01™ software. Photographs other than the portraits of fresh or live specimens were produced from multiple digital images taken with a Canon EOS Rebel XS camera attached to a Zeiss SV-12 dissecting microscope using Zeiss AxioVision 4.8™ software and automatic increments. The image stack was then collated into a single image using Helicon Focus 5.1™ (HeliconSoft) and edited in Adobe LightRoom 4™ and Adobe PhotoShop CS6™. Genetic methods and materials follow those described in Winterbottom *et al*. (2014b).

***Trimma blematium* new species**
Blue-eyed Pygmygoby
Figs. 1–4.
No published names pertain to this species.

**Material examined. Holotype.** ROM 102761, 22.0 mm SL male, Papua New Guinea, Milne Bay Province, Normanby I., Whampus, 09° 58.122' S, 150° 50.350' E, 65 m, 29 May, 2016, field # MVE-16-023, M.V. Erdmann.

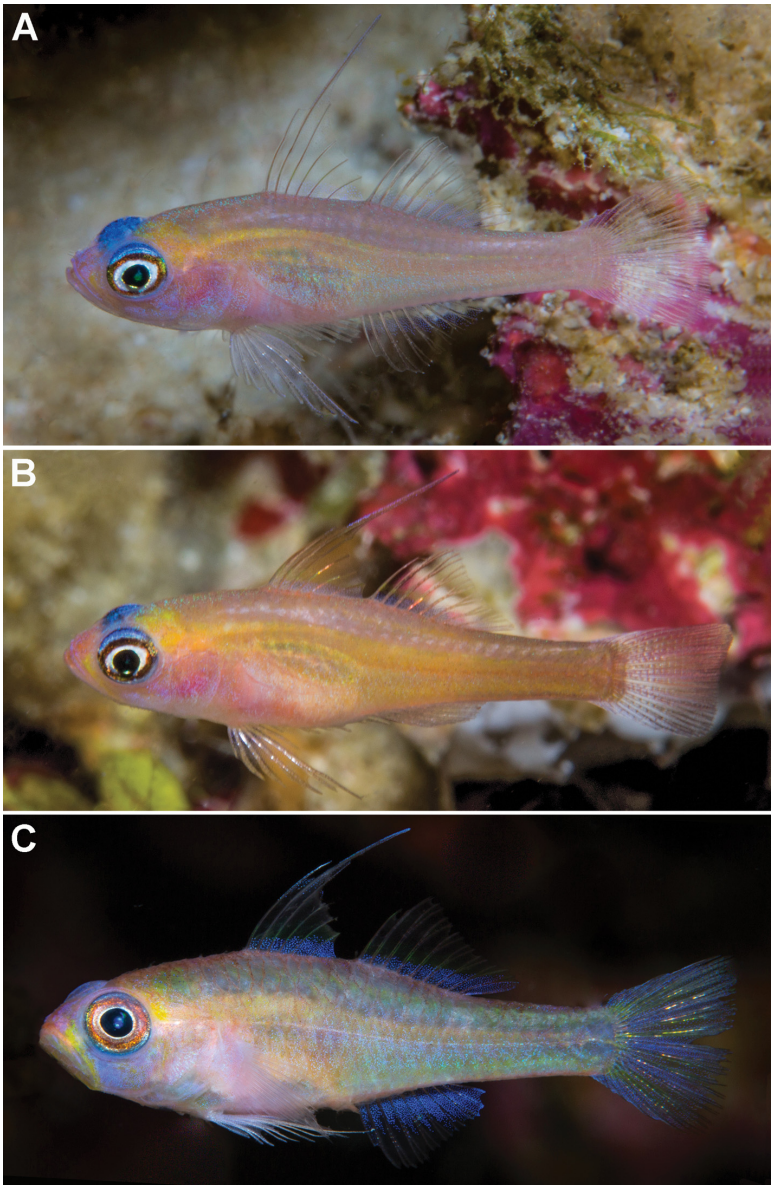


**FIGURE 1.** *Trimma blematium*, live; A & B—Milne Bay; freshly collected: C—Milne Bay. Photos by M.V. Erdmann.

**Paratypes.** ROM 101301, 4(15.9–22.8), collected with the holotype. ROM CS 1972, (16.2 male), collected with the holotype (now cleared and stained). ROM T20892, (13.8), collected with the holotype, tissue specimen.

**Diagnosis.** A species of *Trimma* with scales present on cheeks and opercle, 8–9 scales in predorsal midline, 16 unbranched pectoral fin rays, a branched 5th pelvic fin ray 45–50% length of 4th ray, 20–22 total gill rakers, a broad interorbital (46–63% pupil width) with narrow crease-like postorbital trench ending at posterior-most papilla in row *p*, nasal apparatus small and situated on anterior one-third of snout with posterior nares forming posterodorsal margin of nasal sac, and 7 papillae in row *p* (with a single papilla below row *n*). When live or freshly collected, dorsal surface of eye dark blue; preserved specimens with fairly evenly distributed melanophores over dorsal surface of snout.

**Description.** The description is based on the holotype and 5 paratypes. Dorsal fin VI + I 8–**9** (8.2), second spine elongated (Fig. 1), reaching posteriorly when adpressed to between base of **4th ray** to 1st scale behind last dorsal fin ray (mean = base of 7th ray), first ray of second dorsal fin **branched** (unbranched in one), remaining fin rays branched except for posterior element of last ray, fin reaches posteriorly 39–**41**–50% (44%) distance between base of last ray and first exposed dorsal procurrent caudal fin ray; anal fin I 8, first ray unbranched, fin reaches posteriorly **31**–42% (35%) distance between base of last ray and first exposed ventral procurrent caudal fin ray; pectoral fin 16, all rays unbranched, fin reaching posteriorly to region above urogenital papilla; pelvic fin I 5, fifth ray with single dichotomous branch point and 40–**42**–45% (43%) length of fourth ray, which reaches posteriorly to between bases of anal spine to 2nd anal ray, pelvic rays 1–4 with single sequential branch point; basal membrane forming fold across midline above last pre-pelvic scale; no fraenum. Lateral scales 23; anterior transverse scales 8–**9** (8.1); posterior transverse scales 7–**8** (7.5); cheek with two cycloid scale rows, upper row of **1**–3 and lower row with **8**–9 (1.8 and 8.8 respectively, n = 5), midline of predorsal with **8**–9 (8.5) scales, anterior 1–4 rows may be cycloid, otherwise ctenoid; anteriormost scales on sides (may be ctenoid or cycloid) and top of nape reaching almost to posterior margin of eye; opercle fully scaled above papilla row *oi* in 4–**5** horizontal rows, dorsalmost row of 4, then **3**-4, 3, 2–**3**, **2**–3 and 0-**2** mostly cycloid scales, although larger scales in mid-upper region may be ctenoid, up to 2 small auxiliary scales may be present above upper row; 3 vertical rows of cycloid scales on pectoral fin base with 1–**2**–3 in anteriormost row, 3–**4** in second row and 4 in outer row (n = 5); **7**–8 (7.2) cycloid scales in midline anterior to pelvic fin base; area between pelvic spine and ventral margin of pectoral fin base with cycloid (smaller specimens) or ctenoid (larger specimens) scales; anterior few rows of scales in midline of belly cycloid, those behind ctenoid; circumpeduncular scales 12, scales rows in midline between base of last anal ray and first ventral procurrent caudal fin ray **9**–10 (9.2). Description of teeth based on ROM 1972CS (16.2 mm SL female, jaws excised). Upper jaw with outer row of spaced, enlarged curved canines which decrease slightly in height and reach posteriorly 4/5ths of length of premaxilla, two irregular inner rows of small conical teeth (about half height of outer teeth) becoming reduced to single row at bend of premaxilla and continuing posteriorly to 3/5ths length of premaxilla. Lower jaw with short row of about 3 enlarged, spaced, curved canines from symphysis almost to bend of dentary, about 2 irregular rows of slightly curved smaller (2/3rds height of outer teeth) teeth at symphysis, grading to single row, decreasing slightly in size posteriorly, and reaching to base of coronoid process of dentary. Tongue broadly rounded, may have small central tip. Gill opening extending anteroventrally to below mid-pupil; gill rakers **4**–5 + **16**–17 = **20**–22 (4.2 + 16.5 = 20.7). Nasal apparatus small, situated on anterior one-third of snout, anterior naris short tapering tube reaching anteriorly to above anterior margin of upper lip, posterior opening a large, pore-like opening with slightly raised rim covering posterodorsal width of nasal sac, transverse width of pore about 65% length of nasal capsule, posterior margin of posterior naris well separated from bony front of orbit by 4–**5**–6 times its transverse width (mean = 5.0), nasal sac only very slightly raised above surrounding area of snout (Fig. 2). Bony interorbital width 46–**57**–63% (56.4) pupil diameter; profile of snout gently convex, with shallow concave depression between eyes (between 4th and 5th papillae of row *p*); epaxialis reaching anteriorly in midline to vertical above posterior margin of pupil; no narrow ridge of skin in midline of nape extending anteriorly from origin of first dorsal fin. Caudal peduncle depth as percentage caudal peduncle length 37.9–**39.6**–41.5 (39.4); head length as percentage SL 31.4–**33.8**–35.0 (33.5); as percentage head length: horizontal eye diameter 34.5–**36.4**–37.9 (36.1); snout length 21.4–**28.7** (25.3); cheek depth 14.3–**18.2**–19.6 (17.2). Cephalic sensory papillae as in Fig. 3. Number of papillae in each row: *a* = 6; *b* = 4–**5** (4.7); *c* = 6; *cp* = 1; *d* = 5–**7** (6.7); *d′* = 6–**8**–10 (7.8); *e-anterior* = 11–**12**–15 (13.2, n = 5); *e-posterior* = 12–**15**–17 (14.8, n = 5); *i-anterior* = 6–**7**–8 (7.0, n = 5); *i-posterior* = **7**–8 (7.2, n = 5); *p* = 7, with 2 papillae just medial to posterior naris and one papilla below row *n*; *r* = 2; *f* = 3–**4**–5 (4.0, n = 5); *cs″* = 3 (n = 5); *g* = apparently absent, but may be represented by zig-zag line of 11 papillae (Fig. 3 B); *n* = 1; *x* = 7–**8**–9

(7.8); *u* = **4**–5 (4.2); *z* = 5–**8** (6.8, n = 4); *ot* = 9–**13**–16 (13.2, n = 5); *os* = 8–**9**–11 (9.0, n = 4); *oi* = 4–**6**–7 (5.4, n = 5). Note that posteroventralmost papilla of row *p* is not visible in Fig. 3 A, being covered by edge of eye, but is visible in Fig. 3 B. Abdominal/caudal vertebral transition (see Winterbottom, 2011:130, for definitions) unusual for the genus (based on single cleared and stained specimen, ROM 1972CS, which unfortunately did not take up the alizarin well). No haemal canal present on 9th abdominal vertebra but canal present on 10th vertebra. Two foramina present ventrally on 1st caudal vertebra, with small basal canal and enlarged foramen distally formed by haemal arches joined only at tips (similar to arch found in Type A, but not as well developed).

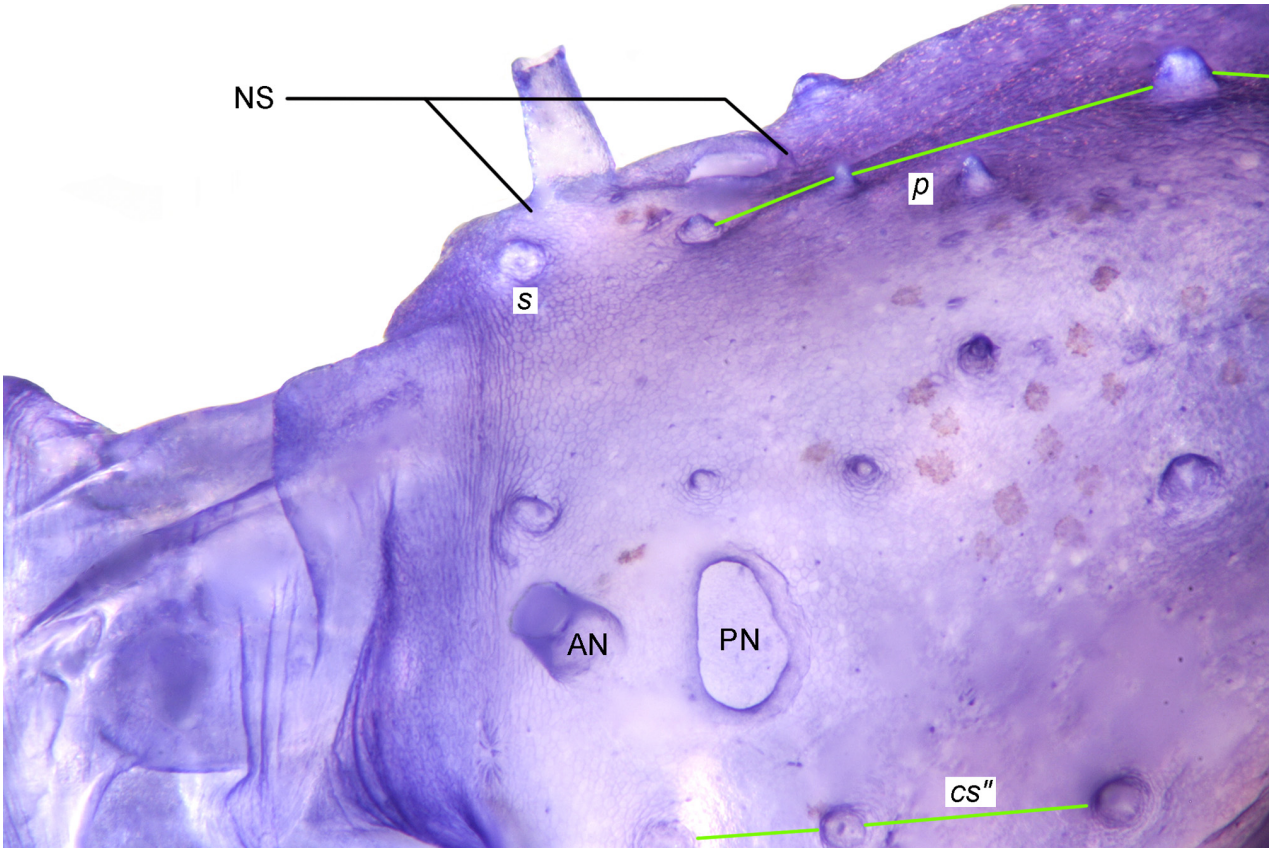


**FIGURE 2.** Oblique (dorsolateral) view of the top of the snout, *Trimma blematium*, 22.0 male holotype, ROM 102761 to show nasal apparatus, specimen stained with cyanine blue. AN = anterior nares; NS = nasal sac; PN = posterior nares; *cs″*, *p*, and *s* = papillae rows. Photo by R. Winterbottom.

*Colour pattern. Live*, based on 10 images from Normanby Island (see Fig. 1, A & B for examples). Head and body translucent light pink or yellow-brown, with large yellowish area posterodorsal to eye over posterior half of braincase, spinal cord yellow but fading into background below end of second dorsal fin, abdomen and lower half of head lighter, snout pink. Iris with white inner margin around pupil followed by dark brown ring, dorsomedial surface of eye dark to medium blue (usually lighter at lateral margins). Basal half of dorsal and anal fins, and pelvic fin membranes heavily invested with iridocytes (Fig. 1 A). *Freshly collected*, based on image of 22.4 mm SL male paratype, ROM 101301 (Fig. 1 C). Upper and lower midlines reddish, body semi-translucent greenish/bluish with scale margins diffusely outlined with dark red, spinal cord and posterior region of cranium dull yellow, medial half of upper lip orange, region of snout below anterior margin of eye greenish-yellow, anterior cheek blue-grey. Dorsal fins with basal stripe of bluish chromatophores, stripe half pupil-width anteriorly to full pupil-width posteriorly, fin elements yellow above this, grading to red more distally, first two spines of first dorsal fin white at extremities; anal fin with similar but much wider (2 X pupil-width) basal stripe; caudal with bluish margins and 3 equidistant blue streaks in body of fin, the middle medial in position, rest of fin greenish-yellow; membranes of pelvic fin with iridocytes, rays off-white, membranes of pectoral fin hyaline with rays light pink. *Preserved*. Holotype pale straw coloured, lighter on head. Melanophores outlining first 1.5 vertical scale rows along dorsum from first predorsal scale almost to end peduncle. A few scattered light brown melanophores on dorsal surface of snout (visible in Fig. 3 B), a few similar melanophores behind eye and along dorsal part of opercle, and basally in membranes of

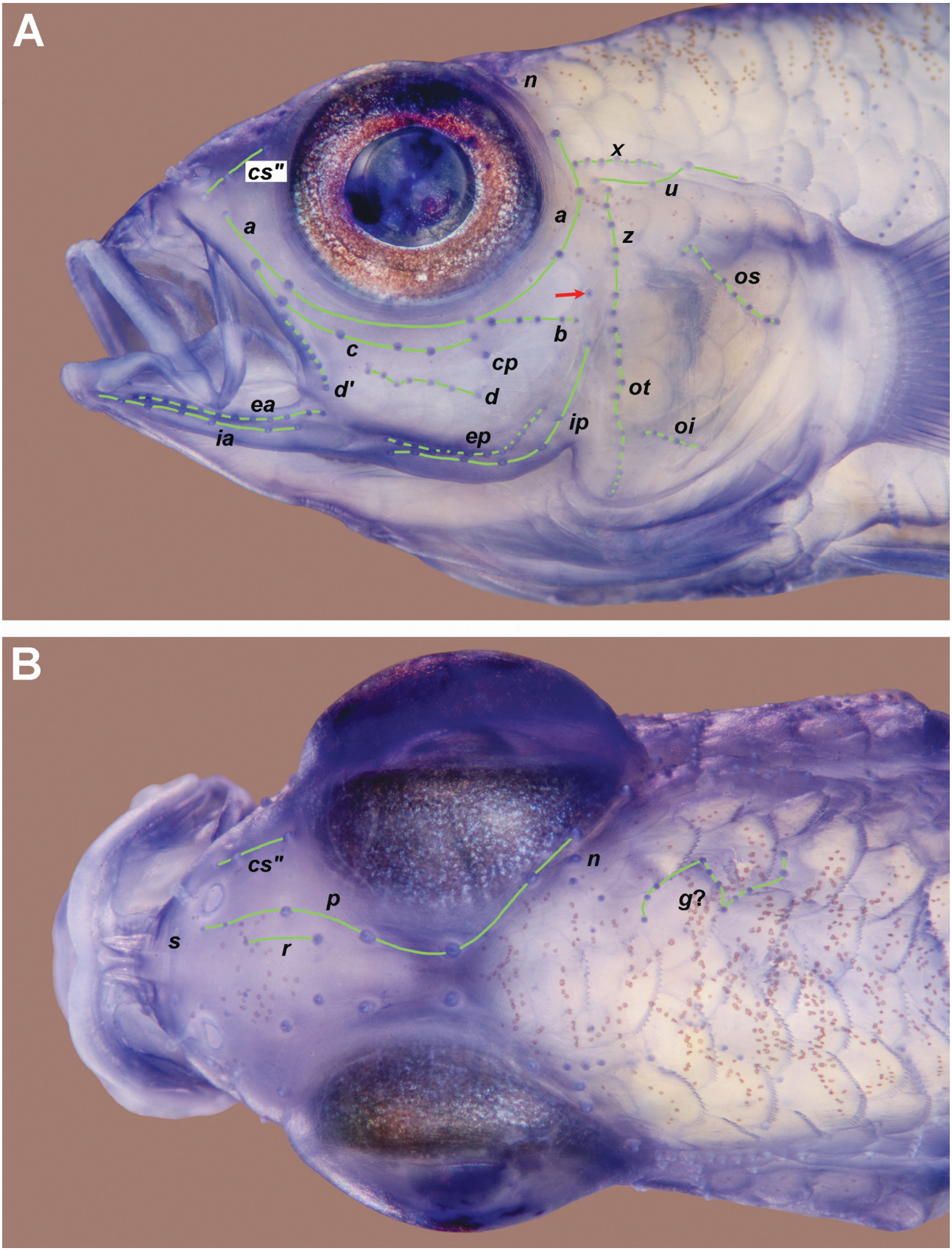


**FIGURE 3.** *Trimma blematium*, 22.0 mm SL male holotype, ROM 102761. Left lateral (A) and dorsal (B) views of head to show papillae, specimen stained with cyanine blue. Papillae in a given row connected by thin green lines, red arrow points to supernumerary papilla. Second letters of abbreviations in *ea, ia, ep* and *ip* stand for anterior and posterior respectively. Photos by R. Winterbottom.

posterior half of second dorsal fin. Iris dark brown with narrow light circle around pupil (Fig. 3 A). No other pigmentation discernible. Paratypes generally somewhat more heavily pigmented, with scale pockets outlined on whole dorsal half of body, and more pigmentation on dorsal surface of snout and upper half of opercle. Thin line of melanophores may be present between base of last anal ray and first ventral procurrent caudal ray. Body pigmentation may extend below midlateral scale row, and include dorsal part of abdomen.

**Etymology.** The specific name 'blematium' is a compound word derived from the Greek μπλε (ble) = blue, and μάτι (máti) = eye, in allusion to the distinctive blue dorsal surfaces of the eyes of the new species. This species has been informally referred to as *Trimma* RW sp. 106.

**Distribution and Habitat.** Currently recorded only from off the southwestern coast of Normanby Island, Milne Bay Province, Papua New Guinea. The species was observed in a mixed rubble and sand habitat on a deep reef slope (60–70 m depth) exposed to significant current and cold-water upwelling.

**Comparisons.** There are 8 other described species of *Trimma* which possess predorsal scales in the midline, a branched 5th pelvic fin ray, and 16 or more unbranched pectoral fin rays. These are: *T. annosum* Winterbottom, 2003, *T. emeryi* Winterbottom, 1985, *T. fasciatum* Suzuki *et al*., 2012, *T. flavicaudatum* (Goren, 1982), *T. fucatum* Winterbottom & Southcott, 2007, *T. kardium* Winterbottom *et al*., 2015, *T. pentherum* Winterbottom & Hoese, 2015, and *T. randalli* Winterbottom & Zur, 2007. The only one of these species in which the second dorsal spine is elongated posterior to the base of the second dorsal fin ray, and in which at least one row of cheek scales is present is *T. randalli*, which differs from *T. blematium* in having 5 papillae in row *c* (vs. 6), 6 (vs. 7) papillae in row *p*, with 1 (vs. 2) papillae just medial to the posterior naris, a narrower bony interorbital (< 35% pupil width vs. > 45%), a basal membrane between the 5th pelvic fin rays that extends 20–40% the distance to the tip of the rays (vs. vestigial and only forming a narrow shelf across the ventral midline), fewer anterior transverse scale rows (7 vs. 8–9), a single row of cheek scales (vs. 2 rows), and in having a black or dark red caudal fin (vs. hyaline). In addition to *T. randalli*, only *T. emeryi* and *T. fasciatum* have been recorded as possessing scales on the cheek, but there are a maximum of two such scales (and often none) and they never form two discreet rows totalling 9–11 scales as in *T. blematium*.

This species is superficially most similar to *T. meityae*, described below, especially in overall colouration and the blue dorsal surface of the eye. However, *T. blematium* differs from *T. meityae* in the number of papillae in row *p* (7 vs. 8, with the former species having a single papilla, vs. 2, below papilla row *n*); in having 16 pectoral fin rays (vs. 17–18), in having a branched fifth pelvic fin ray (vs. unbranched), and in generally having a more extensive distribution of melanophores over the snout (reaching posteriorly as far as posterior papilla of row *r* vs. confined to the region medial to the posterior nares).

**Discussion.** An analysis of the partial COI gene of the two species described here (based on a single specimen of each species, Fig. 4) revealed that they are separated by 7.7% of the base pairs of that gene. Coupled with the morphological differences described above, and a geographical separation of some 2000 kilometres (straight-line) suggests to us the validity of recognizing two distinct species. The two species are phenetically closest to each other, and fall out within the *T. tevegae* grade as defined by Winterbottom *et al*. (2014b).

Both species have been found only in deeper, mesophotic reef habitats (60–70 m for *T. blematium*, 50–60 m for *T. meityae*), although *T. blematium* was found on clean outer reef sand and rubble exposed to significant current, while *T. meityae* was found on silty sand and rubble on a nearshore reef with minimal current.

### *Trimma meityae* new species

Meity's Pygmygoby
Figs. 4–7.
No published names pertain to this species.

**Material examined. Holotype.** ROM 106350, 18.6 mm SL male, Indonesia, West Papua, Pulau Purup, Cendrawasih Bay, 02° 03.188' S, 134° 09.318' E, 56 m, 4 Aug., 2017, M.V. Erdmann.

**Paratypes:** MZB 24599, 2(17.1–17.2), collected with the holotype. ROM T21296, (15.5 mm SL female), Indonesia, West Papua, Cendrawasih Bay, Pulau Purup, 02° 03.188' S, 134° 09.318' E, 52 m, 24 Oct., 2016, field # MVE-16-070, M.V. Erdmann. ROM 106364, 3(17.3–17.7), collected with the holotype. ROM T25134, (16.1), & T25135, (16.8), collected with the holotype.

**Diagnosis.** A species of *Trimma* with scales present on cheeks and opercle, 8–10 scales in predorsal midline, 17–18 unbranched pectoral fin rays, unbranched 5th pelvic fin ray 40–47% length of 4th ray, 21–22 total gill rakers, a broad interorbital (56–79% pupil width) with narrow crease-like postorbital groove, ending at posteriormost papilla in row *p*, 8 papillae in row *p* (with 2 papillae ventral to papilla row *n*), and nasal apparatus small and situated on anterior one-third of snout with posterior nares forming posterodorsal margin of nasal sac. When live or freshly collected, dorsal surface of eye light blue; preserved specimens with melanophores on dorsal surface of snout mostly adjacent to nasal capsules.

**Description.** The description is based on the holotype and 5 paratypes. Dorsal fin VI + I 8, second spine elongated, reaching posteriorly when adpressed to between base of 5th ray to 1st scale behind last dorsal fin ray (Fig. 5, mean = base of 7th ray, holotype to base **ray 8**), first ray of second dorsal fin branched (**unbranched** in two), remaining fin rays branched except for posterior element of last ray, fin reaches posteriorly 46–**57**–61% (54%) distance between base of last ray and first exposed dorsal procurrent caudal fin ray; anal fin I 6–**8** (7.7, single specimen with 6 rays, clearly deformed or due to injury), first ray unbranched, fin reaches posteriorly 31–**33**–42% (34%) distance between base of last ray and first exposed ventral procurrent caudal fin ray; pectoral fin **17**–18 (17.7), all rays unbranched, fin reaching posteriorly to region above urogenital papilla to anal spine; pelvic fin I 5, fifth ray unbranched and 40–**46**–47% (44%) length of fourth ray, which reaches posteriorly to between bases of anal spine to 2nd anal ray, pelvic rays 1–4 with single sequential branch point; basal membrane forming fold across midline above last pre-pelvic scale; no fraenum. Lateral scales 23; anterior transverse scales 8; posterior transverse scales 7; cheek with two rows cycloid scales, upper row of **1**–2 and lower row with 6–**7** (means = 1.5 and 6.8 respectively, midline of predorsal with 8–**9**–10 (9.0) scales, anterior 1–4 rows may be cycloid, otherwise ctenoid; anteriormost scales on sides (may be ctenoid or cycloid) and top of nape reaching anteriorly almost to posterior margin of eye; opercle fully scaled above papilla row *oi* in 4 horizontal rows, dorsalmost row of **4**–5, then 2–**3**, **3** and **1**–2 mostly cycloid scales, although scales in mid-upper region may be ctenoid; 3 vertical rows of cycloid scales on pectoral fin base with **1**–2 in anteriormost row, 2–**3** in second row and 5 in outer row; **7**–8 (7.2) cycloid scales in midline anterior to pelvic fin base; area between pelvic spine and ventral margin of pectoral fin base with cycloid (smaller specimens) or ctenoid (larger specimens) scales; anterior few rows of scales in midline of belly cycloid; circumpeduncular scales 12, scales rows in midline between base of last anal ray and first ventral procurrent caudal fin ray 8–**9**–10 (9.2). Upper jaw with outer row of spaced, enlarged curved canines which decrease slightly in height and reach posteriorly 4/5ths of length of premaxilla, two irregular inner rows of small conical teeth (about half height of outer teeth) becoming reduced to single row at bend of premaxilla and continuing posteriorly to 3/5ths length of premaxilla. Lower jaw with short row of about 5 enlarged, spaced, curved canines from symphysis almost to bend of dentary, about 2 irregular rows of slightly curved smaller (2/3rds height of outer teeth) teeth at symphysis, grading to single row, decreasing slightly in size posteriorly, and reaching almost to tip of coronoid process of dentary. Tongue broadly rounded to spatulate with small central tip. Gill opening extending anteroventrally to below mid to posterior pupil; gill rakers **4**–5 + 16–**18** = 21–**22** (4.7 + 17.0 = 21.7). Nasal apparatus small, situated on anterior one-third of snout, anterior naris short tapering tube reaching anteriorly to above anterior margin of upper lip, posterior opening a large, pore-like opening with slightly raised rim covering posterodorsal width of nasal sac, transverse width of pore about 65% length of nasal capsule, posterior margin of posterior naris separated from bony front of orbit by **3.5**–4.0 times its transverse width (mean = 3.9), nasal sac only very slightly raised above surrounding area of snout (Fig. 6). Bony interorbital width 56–**70**–79.0% (65.4) pupil diameter; profile of snout gently convex, with shallow concave depression between eyes (between 4th and 5th papillae of row *p*); epaxialis reaching anteriorly in midline to vertical above posterior margin of pupil; no narrow ridge of skin in midline of nape extending anteriorly from origin of first dorsal fin. Caudal peduncle depth as percentage caudal peduncle length 34.4–**42.2** (38.4); head length as percentage SL 32.9–**33.2**–35.2 (33.7); as percentage head length: horizontal eye diameter **34.6**–38.9 (36.9); snout length 21.2–**22.1**–22.8 (22.2); cheek depth 16.8–**20.9**–21.2 (19.1). Cephalic sensory papillae as in Fig. 7. Number of papillae in each row: *a* = 6; *b* = 4–**5**–6 (5.0); *c* = 6; *cp* = 1; *d* = 6–**7** (6.5); *d′* = 6–**7**–8 (7.3); *e-anterior* = 12–**13**–14 (12.8); *e-posterior* = 12–**15**–17 (14.5); *i-anterior* = **6**–7 (6.7); *i-posterior* = 7; *p* = **8**, with 2 papillae just medial to posterior naris and 2 papillae ventral to row *n*; *r* = 2; *f* = **3**–4 (3.2); *cs″* = 3; *g* = apparently absent, but may be represented by zig-zag line of 7 papillae in one specimen; *n* = 1; *x* = 6–**7**–8 (7.2, n = 5); *u* = 4–**5** (4.3); *z* = 5–**7** (6.3, n = 4); *ot* = 11–**13** (12.3, n = 3); *os* = 7–**8** (7.7, n = 3); *oi* = 4–**7** (5.5, n = 4). Abdominal/caudal vertebral transition not examined.

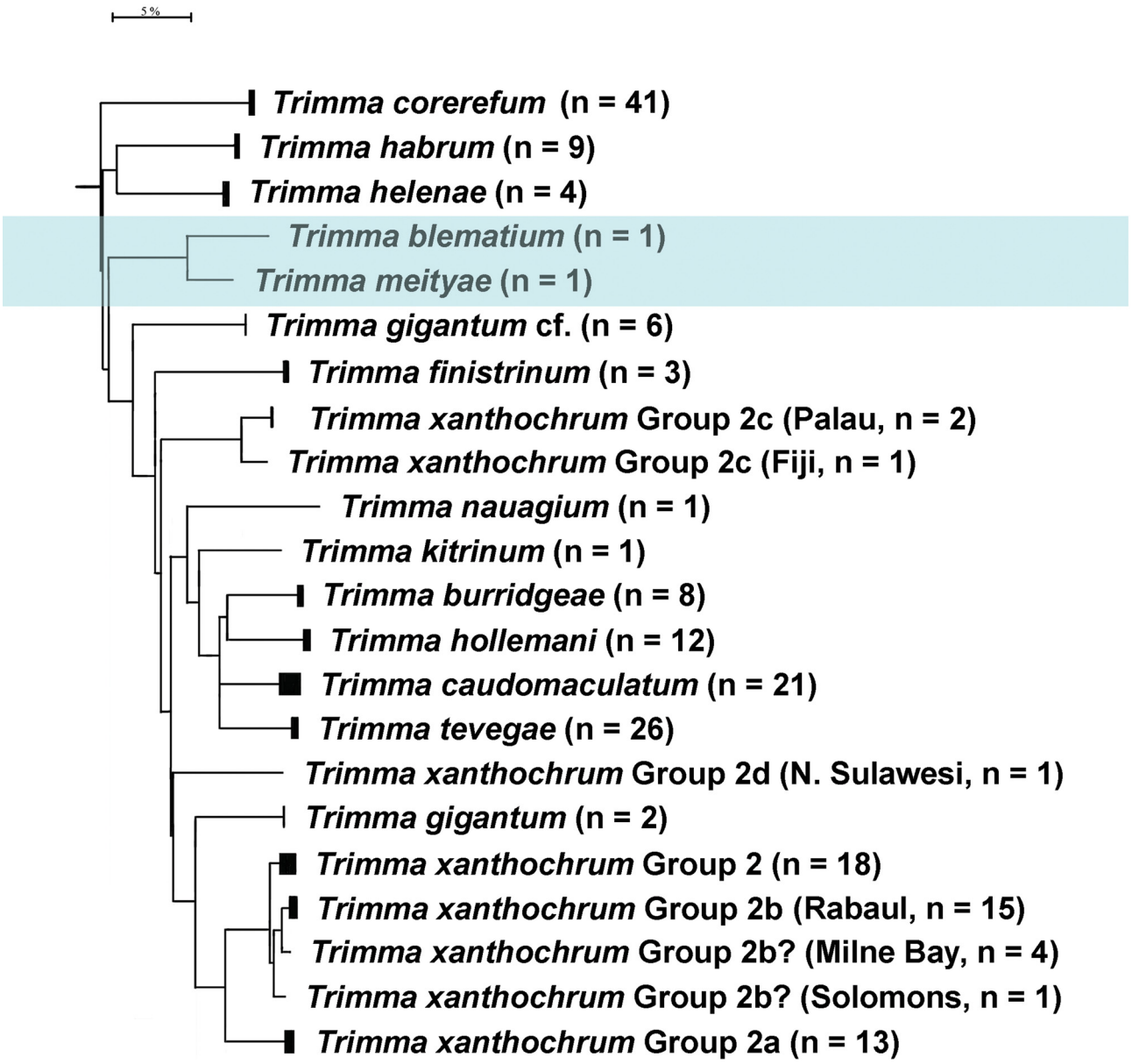


**FIGURE 4.** Neighbour Joining network derived from a BOL analysis of the COI gene of the *Trimma* haplogroups associated with *T. blematium* and *T. meityae*. Image by R. Winterbottom.

*Colour pattern. Live*, based on 12 images from Cendrawasih Bay, West Papua, Indonesia. Specimens (Fig. 5, A, B) almost entirely translucent light pink or off-white with yellow spinal cord, much lighter and brighter blue over dorsomedial surface of eye than *T. blematium*, brown iris ring relatively indistinct and white inner ring around pupil wider and about half iris width. Fin rays pinkish, no apparent pigmentation in fin membranes. Other photographed specimens from this locality with darker pink background and blue over eyes less well developed. *Freshly collected*, (Fig. 5 C). Upper and lower midlines reddish, body semi-translucent greenish with scale margins diffusely outlined with dark red, posterior region of cranium dull yellow, snout reddish, distal half of upper lip and region of snout below anterior margin of eye orange-red. Dorsal fins with basal stripe of whitish chromatophores, stripe half pupil-width anteriorly to full pupil-width posteriorly, fin elements pink above this; caudal with blue-purple margins and 3 equidistant similar streaks in body of fin, the middle medial in position, rest of fin greenish-yellow; membranes of pelvic fin with some iridocytes, rays off-white, membranes of pectoral fin hyaline with rays light pink. *Preserved*. Holotype pale off-white with scale margins in predorsal region and dorsal-most scale row along entire dorsum outlined with brown melanophores; a thin line of melanophores in midline from end of anal fin

base almost to first ventral procurrent ray, a few melanophores medial to posterior nares (Fig. 7 B), on snout below anteroventral margin of eye, and from upper operculum anterior to posterior margin of eye (Fig. 7 A). Paratypes similar, but lack melanophores anteroventral to the eye, and may lack those over operculum.

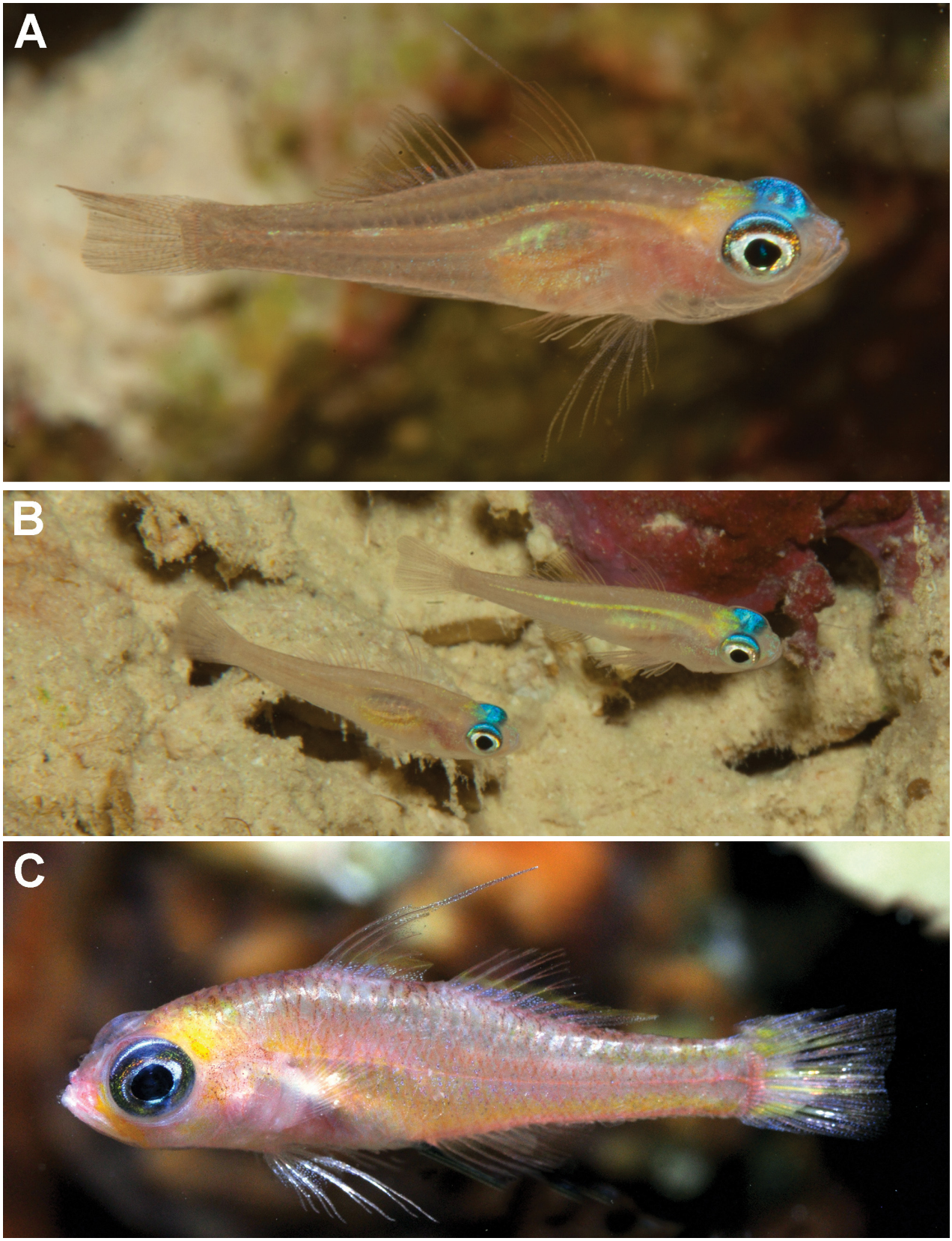


**FIGURE 5.** *Trimma meityae*, live; A & B—Cendrawasih Bay; C—freshly collected, Cendrawasih Bay. Photos: A & B Figure by M. V. Erdmann; C by G. R. Allen.

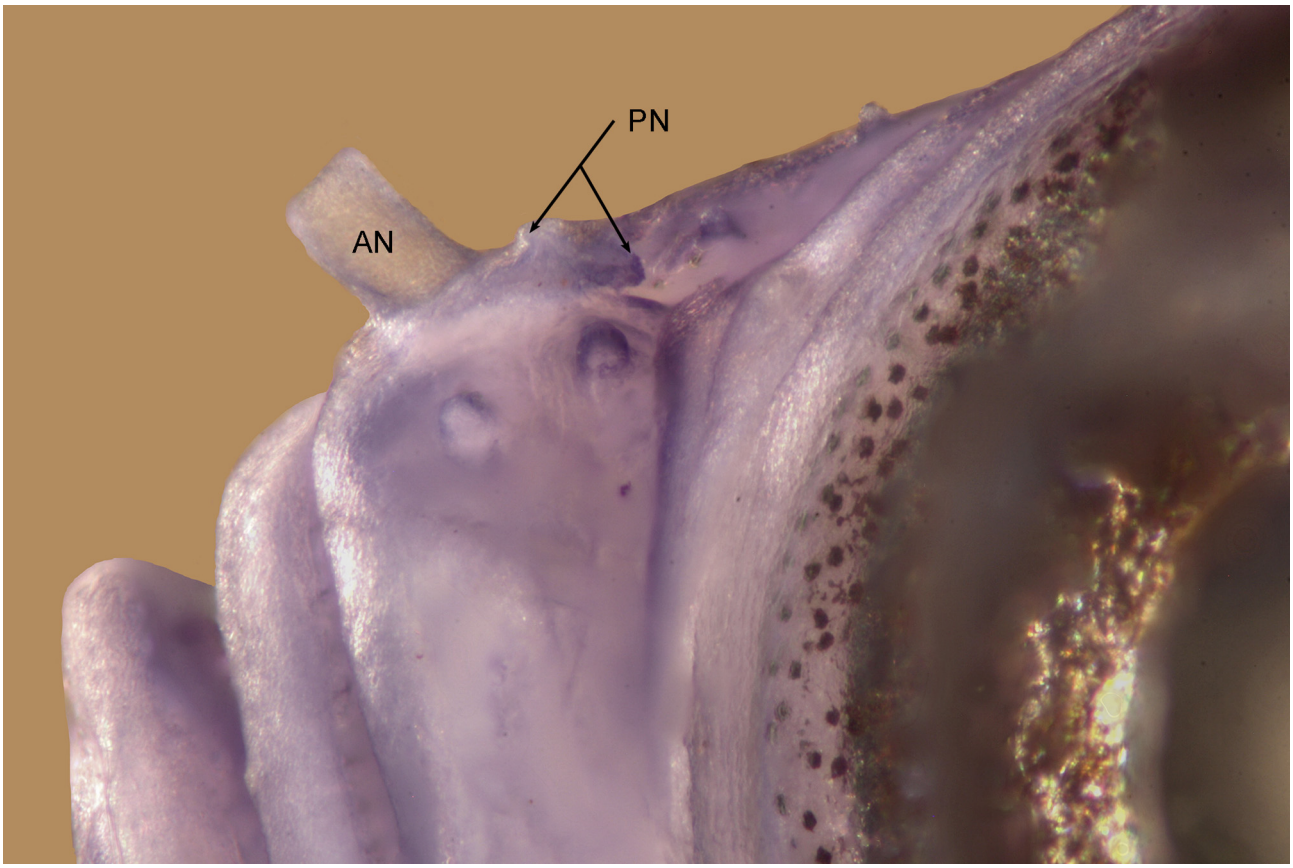


**FIGURE 6.** *Trimma meityae*, 17.3 mm SL male paratype, ROM 106364, Cendrawasih Bay, lateral (and slightly dorsal) view of left nasal apparatus, specimen stained with cyanine blue. Photo by R. Winterbottom.

**Etymology.** The species is name "meityae" in honour of Meity Mongdong, one of Indonesia's foremost marine conservationists, who has dedicated the past several decades of her career towards expanding and improving the management of marine protected areas in West Papua, including the Cendrawasih Bay National Park where this species is found.

**Distribution and habitat.** This species is currently known only from Cendrawasih Bay (Pulau Purup), West Papua, Indonesia. It was observed and collected from a nearshore reef with almost no exposure to waves or currents, in the 50-60 m depth zone only, on a silty sand and rubble slope.

**Comparisons.** There are 9 other described species of *Trimma* which possess predorsal scales in the midline, scales on the cheek, unbranched pectoral fin rays, an unbranched 5$^{th}$ pelvic fin ray, and a bony interorbital width that is ~50% or more of the pupil width. These are: *T. abyssum* Allen, 2015, *T. burridgeae* Winterbottom, 2016, *T. caudomaculatum* Yoshino & Araga, 1975, *T. corerefum* Winterbottom, 2016, *T. habrum* Winterbottom, 2011, *T. helenae* Winterbottom *et al*., 2014a, *T. hollemani* Winterbottom, 2016, *T. kitrinum* Winterbottom & Hoese, 2015 and *T. tevegae* Cohen & Davies, 1969. None of these species has 17 or more pectoral fin rays as found in *T. meityae*. *Trimma abyssum* has 16 such rays (the others have 15 or fewer), but has a second dorsal spine reaching posteriorly only as far as the bases of the first or second ray of the second dorsal fin (vs. to between base of 5$^{th}$ ray to 1$^{st}$ scale behind last dorsal fin ray in *T. meityae*). Only three of these species have been recorded with as many as 21 total gill rakers (*T. burridgeae* with 19-21 (mean = 19.6), *T. caudomaculatum* with 17–21 (18.9) and *T. kitrinum* 20–22 (21.3), versus 21–22 (21.7) in *T. meityae*. In these species, the bony interorbital is 70–100% of pupil width (vs. 56–79.0%, mean = 65.4). A dark caudal spot is present in all the above listed species except *T. meityae*, *T. habrum*, *T. helenae* and *T. kitrinum*, where it is absent. See *T. blematium* under the Comparisons section for the similarities and differences between that species and *T. meityae*.

**Discussion.** See *T. blematium* under the Discussion section for comments.

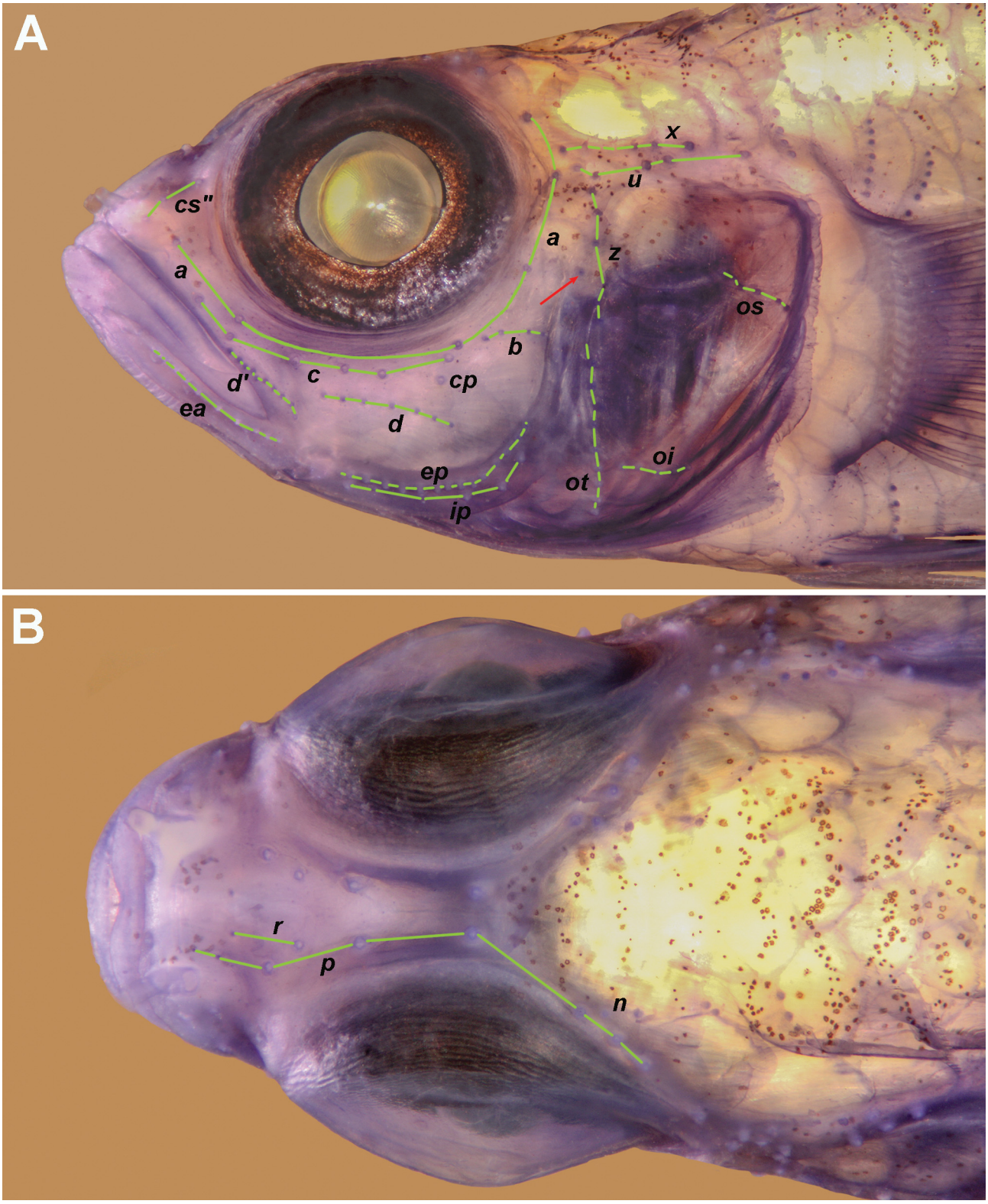


**FIGURE 7.** *Trimma meityae*, 18.6 male holotype, ROM 106350. Left lateral (A) and dorsal (B) views of head papillae, specimen stained with cyanine blue. Papillae in a given row connected by thin green lines, red arrow points to supernumerary papilla. Second letters of abbreviations in *ea, ep* and *ip* stand for anterior and posterior respectively. Photos by R. Winterbottom.

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**Note added in proof:** The two tissue specimens of *T. meityae* not included in the original BOLD analysis have now been added. There is no difference in COI between these two samples and the original specimen used in the analysis.