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THE GENUS *CYCLOPORUS* (PLATYHELMINTHES: POLYCLADIDA) FROM AUSTRALASIAN WATERS

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ABSTRACT. – Eight new species belonging to the genus *Cycloporus* (Platyhelminthes, Polycladida, Euryleptidae) are described from Australasian waters including eastern and western Australia and Papua New Guinea. The widely distributed species, *Cycloporus variegatus* is also redescribed and photographed for the first time. This study significantly increases the number of known *Cycloporus* species from 6 to 14 worldwide. Species are diagnosed primarily on their colour patterns and arrangement of their eyes.

KEY WORDS. – *Cycloporus,* Platyhelminthes, Polycladida, taxonomy.

INTRODUCTION

Of all the polyclad flatworms, the pseudocerotids (Platyhelminthes, Polycladida) are thought to be the most conspicuous and diverse throughout tropical and subtropical waters (Newman & Cannon, 1994a, b, 1995a, 1997, 1998; Newman & Anderson, 1997; Newman et al., 1994).

Recent studies have shown that the little known euryleptids are also diverse and colourful in warm seas. However, they may be often confused with the pseudocerotids and, therefore, overlooked (Newman & Cannon, 2000; Newman et al., 2000).

According to Faubel (1984) and Prudhoe (1985) there are only six known species of *Cycloporus* known worldwide (Table 1). Eight new species are described here from eastern and western Australian waters and from Madang, east Papua New Guinea. *Cycloporus variegatus* Kato, 1934 is also redescribed. The genus *Cycloporus* is discussed, as well as, taxonomic characters used to describe new species.

MATERIAL AND METHODS

Animals were collected by hand from the reef crest and on scuba from the reef slope from Heron Island (23° 27' S, 151° 55' E), One Tree Island (23° 30' S, 152° 05' E), southern Great Barrier Reef (GBR); Lizard Island (14° 40' S, 145° 28' S), northern GBR; Stradbroke Island (27° 27' S, 153° 25' E) and Mooloolabah (26° 48' S, 153° 08' E, southeast Queensland; Freemantle (32° 08' S, 115° 44' E) and Coral Bay (23° 9' S, 113° 46' E), western Australia; and north Madang (5° 14' S, 145° 45' E), Papua New Guinea (PNG).

Worms were photographed *in situ*, fixed on frozen polyclad fixative (see Newman & Cannon, 1995b) and preserved in 70% ethanol for histological preparations. Whole mounts were stained with Mayer's haemalum, dehydrated in graded alcohols and then mounted in Canada balsam. Longitudinal serial sections of the reproductive region were obtained from specimens embedded in Paraplast (56° C), sectioned at 5 - 7 μm, and then stained with haematoxylin and eosin.

Measurements of the body were taken from live animals in a relaxed state and are given as length mm x width mm. Measurements of the reproductive organs are taken from the paratypes. Reconstruction of the reproductive system is diagrammatic and derived from the sections with minimal interpretation. Drawings were made with the aid of a camera lucida. This material is lodged at the Queensland Museum (QM) as wholemounts (WM), serial sections (LS) and wet specimens (S).

TAXONOMY

FAMILY EURYLEPTIDAE

Cycloporus Lang, 1884
(Fig. 1)

Cycloporus Lang, 1884: 431, 569 pl. VII: type species *Cycloporus papillosus* (M. Sars in Jensen, 1878) Faubel, 1984: 222; Prudhoe, 1985: 136-138,157-158. Gender: masculine.

Diagnosis. – Emended from Faubel (1984) and Prudhoe (1985). Euryleptidae with elongate to round oval body with smooth or knobbed dorsal surface, variably coloured and patterned (Fig. 1A). Marginal tentacles small bumps or short and pointed. Two elongate cerebral eyespots or clusters present. Dorsal and ventral tentacular surfaces with scattered eyespots. Branched intestines with four to ten pair of lateral branches, branches continuous with small round peripheral vesicles at the margin that open to the exterior through minute pores. Male copulatory apparatus with antero-dorsally orientated prostate, unbranched vas deferens and armed penis (Fig. 1B). Female apparatus with multiple uterine vesicles and extensive cement glands when mature.

Remarks. – Members of the genus *Cycloporus* may be easily confused with pseudocerotids, especially the genus *Pseudoceros* since they are similarly shaped and coloured. However, with closer examination, *Cycloporus* may be easily distinguished from *Pseudoceros* by the following features (Fig. 1A):

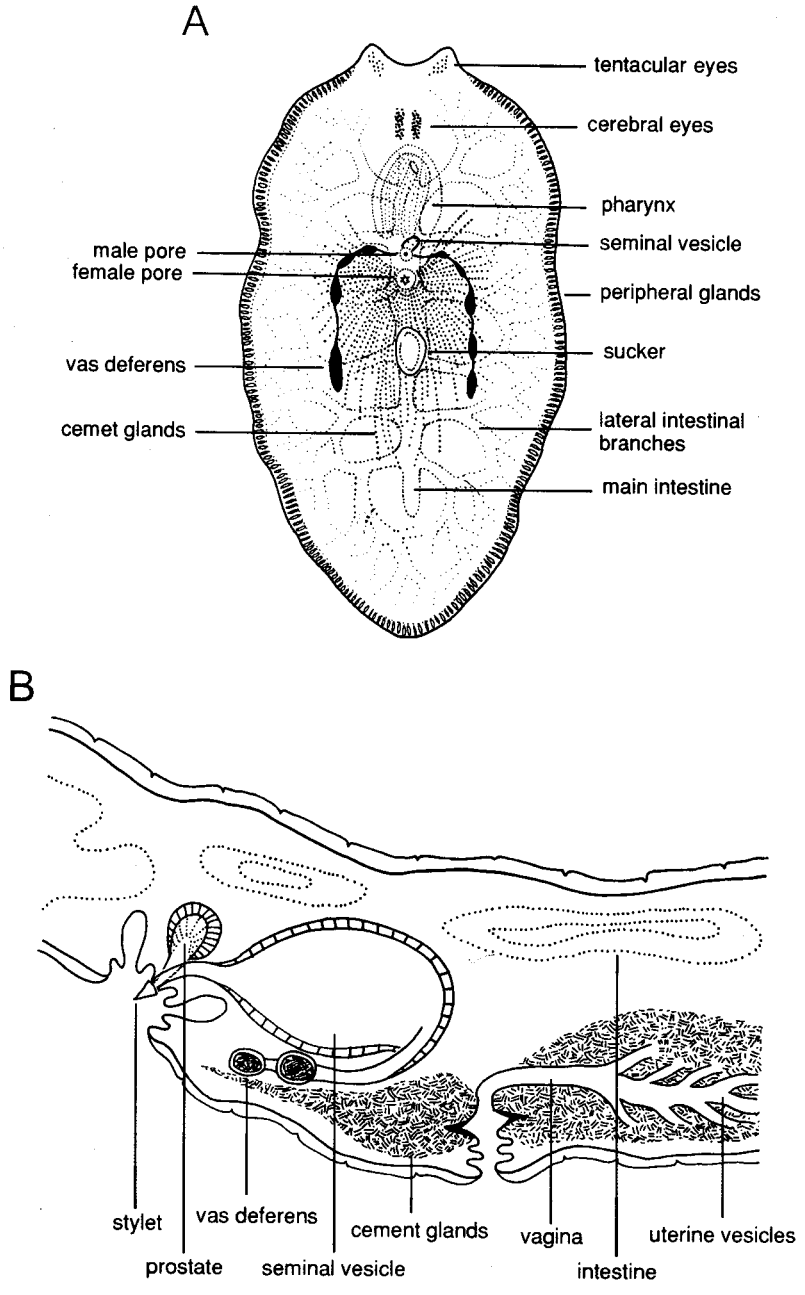

Fig. 1. A. Diagram of *Cycloporus*, ventral view showing details of the digestive and reproductive systems; B. Diagram of reproductive systems from longitudinal section.

- distinct small, anterior, tubular pharynx (not ruffled)
- comparatively small size – usually less than 20 mm (compared to an average size of 20 mm)
- transparent margin with yellow or white peripheral glands (absent in all pseudocerotids)
- presence of tentacular bumps (rather than pseudotentacles formed from upfoldings of the anterior margin)
- two elongate eye clusters with numerous eyes (rather than one cluster with relatively few eyes arranged in a horseshoe shaped cluster)
- extensive branching oviducts in mature animals (oviducts are restricted laterally along the intestine).

The internal reproductive anatomy in *Cycloporus* is remarkably similar to that of the pseudocerotids. The only difference that can be noted from the details of the male anatomy is that the seminal vesicle is significantly larger than the prostate and the penis stylet is relatively small and wide (Fig. 1B). However, due to the plastic nature of these animals, comparisons by direct measurements are not reliable. Furthermore, details of the reproductive structures have not, to date, been used to differentiate species of *Cycloporus*. Newman & Cannon (1994a, 1995a, 1997, 1998, 2000) concluded that species determination within a genus (pseudocerotids and euryleptids) could rely on colour pattern alone. Litviatis & Newman (2001), from molecular studies, confirmed the use of colour patterns to distinguish species of pseudocerotids.

The following six species may be reliably placed in *Cycloporus* sensu strictu based on the morphology of the pharynx, eye arrangement, shape of the tentacles, presence of marginal peripheral vesicles and presence of four to ten pairs of lateral intestinal branches; *C. australis* Prudhoe, 1982; *C. gabrielle* Marcus, 1950; *C. maculatus* Hallez, 1893; *C. misakiensis* Kato, 1934; (syn. *C. japonicus* Kato, 1944); *C. papillosus* Lang, 1884 and *C. variegatus* Kato, 1934 (see Table 1). Lang (1884) mentions *C. papillosus* var. *laevigatus* which is described as lacking the characteristic papillae. However, he did not provide many descriptive details and hence we have not included this "variety" in Table 2.

Cycloporus albofasciatus, new species
(Figs. 2A, B, 11A)

Material examined. – Holotype - WM (QM G211207), 3m, under rubble, reef slope, N Madang, PNG, 31 Mar.1994.

Description. – Body oval without marginal ruffles (Figs. 2A, 11A). Entire dorsal surface covered with extremely small, short, raised round papillae, evenly spaced and regular; papillae do not extend to the margin. Intestine with 4 or 5 lateral branches. Cerebral eyespots with about 30 eyes each, about 15-20 scattered tentacular eyes each side (Fig. 2B). Size: 7 x 4 mm (mature) (see Table 2).

Transparent yellow-brown (dark brown pigment due to food in gut diverticula) with irregular spots, dots and transverse opaque white blotches extending to the margin (Fig. 11A, Table 2). Margin clear yellow-brown. Ventrally yellow-brown.

Diagnosis. – Papillate, yellow-brown with white transverse streaks.

Etymology. – Named from the Latin *albus* = white and *fascia* = stripe, for its distinct pattern of white transverse streaks.

Remarks. – Two other species possess dorsal papillae, *C. papillosus* Lang, 1884 and *C. xanthopunctatus*, new species (Tables 1, 2). This current species has white transverse streaks across the papillae and only about 30 cerebral eyes per side (not varying coloured papillae and numerous cerebral eyes as in *C. papillosus*). This species also differs from *C. xanothopuncatus*, new species, since it has white transverse streaks (not median yellow spots).

Habitat & distribution. - Found inside a transparent colonial ascidian. Rare from N Madang, PNG.

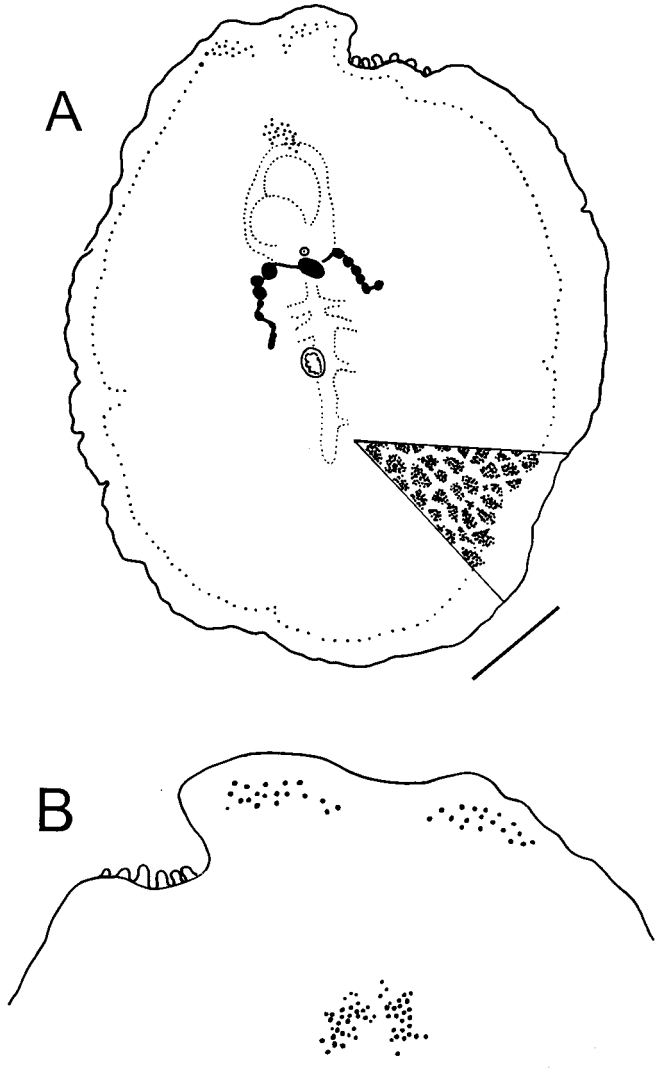

Fig. 2. *Cycloporus albofasciatus*, new species. A. Whole mount from the ventral side, showing details of food in the gut, bar = 1.0 mm; B. Dorsal eye arrangement.

Cycloporus atratus, new species
(Figs. 3A, B, 11B)

Material examined. – Holotype - WM(QM G211062), under rubble, reef crest, Heron Is., S GBR, 14 Feb.1992.

Paratypes – WM (QM G211061), same data, 2 Feb.1991; LS(QM G211076), same data, 9 Mar.1997.

Description. – Small and oval with no marginal ruffles, tentacles small bumps (Figs. 3A, 11B). Cerebral eyespot with few eyes, 10 eyes each; tentacular bumps with about 15 to 20 scattered eyes each (Fig. 3B). Size: 8 x 5 mm (mature) (see Table 2).

Transparent black with irregular yellow blotches and regular yellow microdots over the entire dorsal surface, short transverse streaks near margin, yellow intermittent blotches medially (Fig. 11B, Table 2). Tentacular bumps orange, large white triangular spot in between. Margin clear with yellow peripheral vesicles. Ventral pattern similar but fainter.

Diagnosis. – Black, yellow blotches and dots; tentacular bumps orange with white spot in between. Few cerebral and tentacular eyes.

Etymology. – Named from the Latin *atratus* = dressed in black, for its transparent black colour pattern.

Remarks. – No other species has a black background colour and orange tentacular bumps with a white spot in between (see Tables 1, 2).

Habitat & distribution. – Two animals found together under rubble at the reef crest, Heron Is., southern GBR. These worms were extremely active when disturbed.

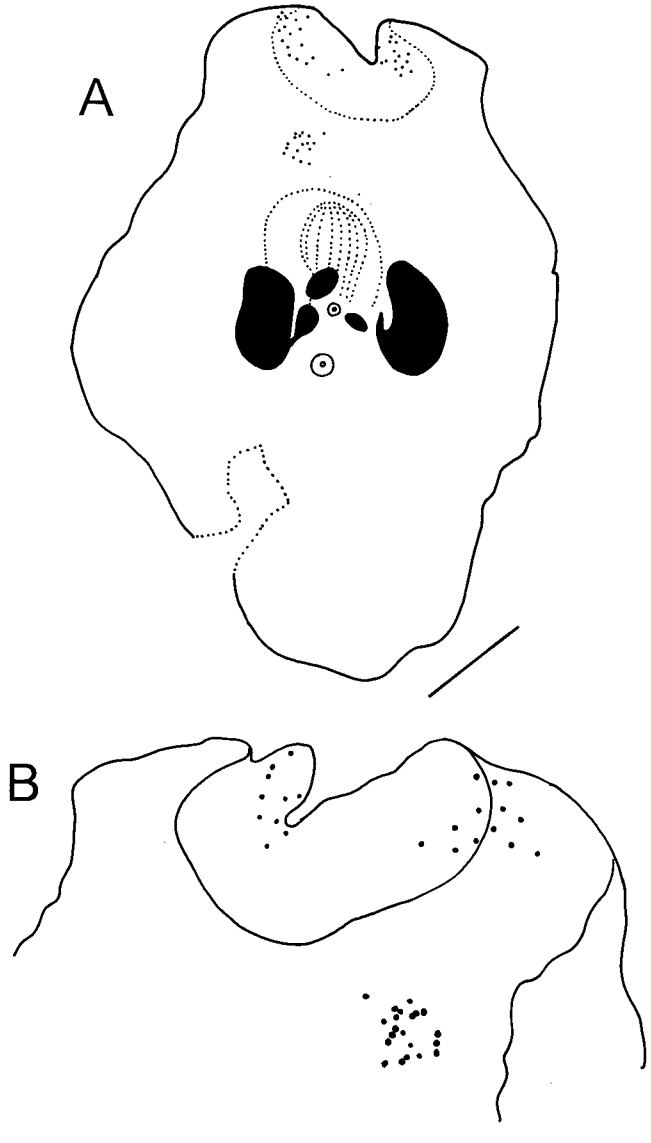

Fig. 3. *Cycloporus atratus*, new species. A. Whole mount from the ventral side, bar = 0.5 mm; B. Dorsal eye arrangement.

Cycloporus guttatus, new species
(Figs. 4A, B, 11C)

Material examined. – Holotype - WM(QM G211205), under rubble, reef crest, Heron Is., 31 Jul.1989.

Paratypes – WM (QM G211206), same data; WM (QM G211204), same data, 26 Jun.1991.

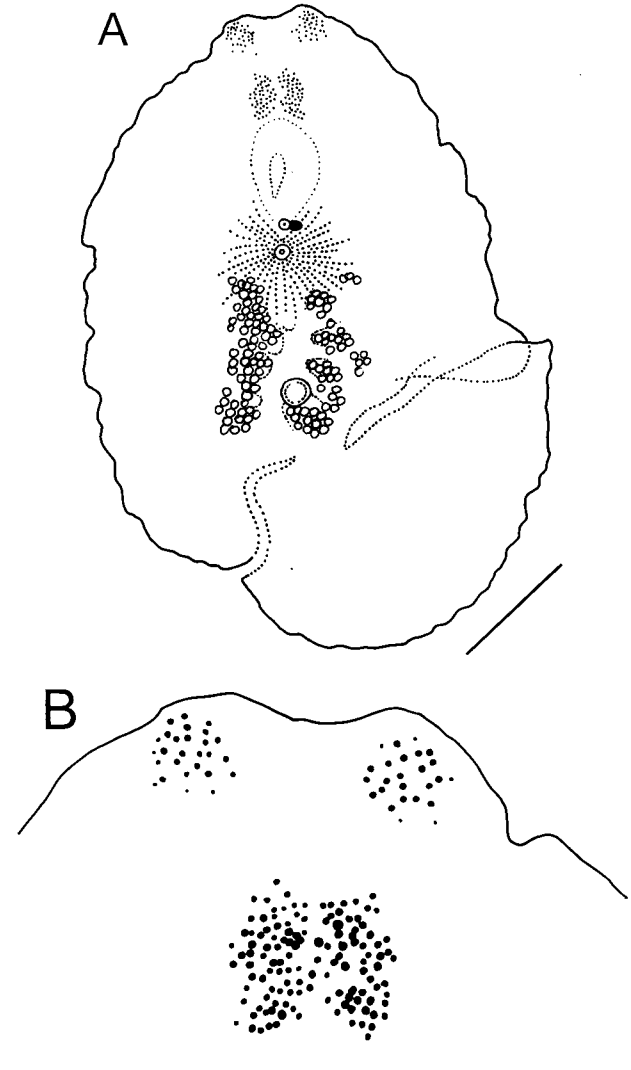

Fig. 4. *Cycloporus guttatus*, new species. A. Whole mount from the ventral side, bar = 1.0 mm; B. Dorsal eye arrangement.

Others – WM (QM G21203), damaged, under rubble, reef crest, One Tree Is., south GBR, 14 Aug.1989.

Description. – Extremely small, body oval, no marginal ruffles (Figs. 4A, 11C). Tentacles only slight bumps. Intestine with about 4 lateral intestinal branches. Cerebral eyespots with numerous eyes about 50 to 70 each, tentacular bumps with about 20 to 30 eyes each (Fig. 4B). Size: 4 x 3 mm (mature) (see Table 2).

Transparent cream with light brown markings (food in gut diverticula), numerous evenly spaced red dots scattered over the entire dorsal surface and opaque white spots over the tentacles and in between (Fig. 11C, Table 2). Margin clear with opaque white spots.

Diagnosis. – Cream with red dots and numerous cerebral eyes.

Etymology. – Named from the Latin *guttatus* = dappled, for its red dots.

Remarks. – No other species possesses red dots over its entire dorsal surface (Tables 1, 2). This species most closely resembles *C. australis* Prudhoe, 1982 and C. *reticulatus*, new species. However, this species has only about four intestinal branches (not 8 or 9 as in *C. australis*) and this species also possesses distinct red dots over its dorsal surface which are lacking in *C. reticulatus*, new species.

Habitat & distribution. – Animals appeared as small scars on an encrusting colonial ascidian on which it was probably feeding. Rare from Heron Island, southern GBR.

Cycloporus harlequin, new species
(Figs. 5A, B, 11D, E)

Material examined. – Holotype - WM (QM G211077), under rubble, reef crest, Heron Is., S GBR, 3 Mar.1997.

Paratype – LS (QM G211073), same data, 10 Mar.1997.

Description. – Small, margin not ruffled (Figs. 5A, 11D, Table 2). Tentacles slight bumps only. Extensive cement glands and oviducts. Cerebral eyespots with about 15 to 20 eyes each, tentacular bumps with about 15 to 20 eyes each (Fig. 5B). Size 6 x 4 mm (mature).

Background not transparent but opaque light cream with a bold pattern of large irregular black spots or patches with smaller, scattered black irregular spots; several irregular pink dots medially and posterio-laterally (Figs. 11D, E, Table 2). Marginal band orange becoming yellow anteriorly at the tentacles, narrow white rim. Ventrally cream with some faint black blotches.

Diagnosis. – Opaque white with irregular black patches and orange marginal band.

Etymology. – Named "harlequin" for its distinct black and white pattern and comic appearance.

Remarks. – This species does not resemble any other *Cycloporus* (see Tables 1, 2).

Habitat & distribution. – Two worms found together on a solitary ascidian under a boulder at reef crest, Heron Is., southern GBR (Fig. 11E).

Cycloporus reticulatus, new species
(Figs. 6A, B, 11F)

Material examined. – Holotype - WM (QM G211210), under rubble, reef crest, Heron Is., S GBR, 9 Jun.1992.

Paratypes – WM (QM G211038), 3 specimens, same data, 2 Feb.1992; G211040 (S), same data, 2 Feb.1992.

Others – LS (QM G211039), reef slope, 10 m, N Madang, PNG, coll. T. Gosliner, 12 Jun.1992; LS (QM G211090, under rubble, 2 m, S Coral Bay, WA, 24 Apr.1996.

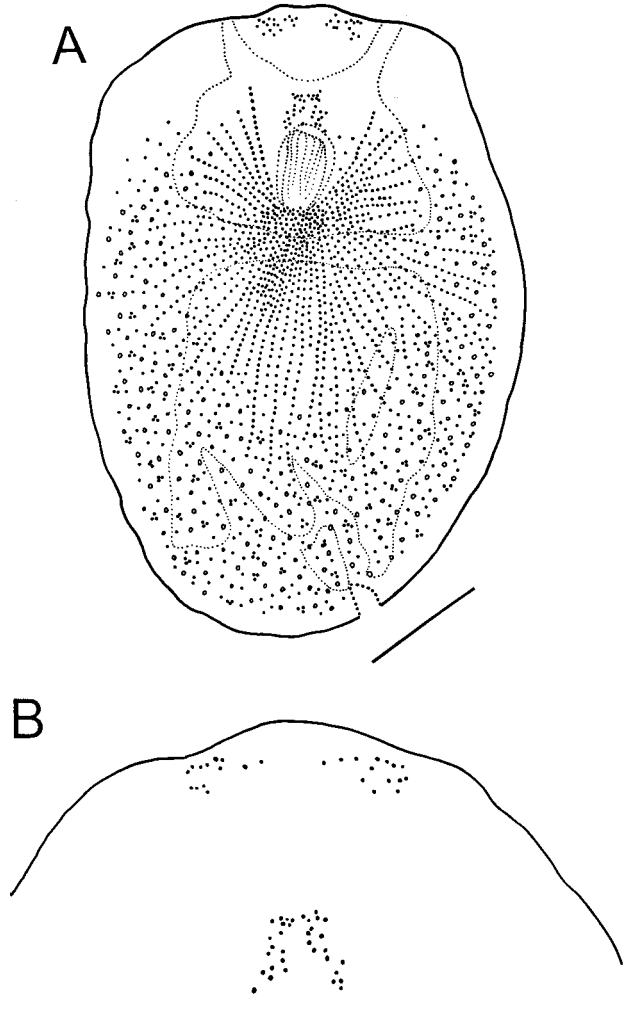

Fig. 5. *Cycloporus harlequin*, new species. A. Whole mount from the ventral side, bar = 1.0 mm; B. Dorsal eye arrangement.

Description. – Small and oval, margin with few shallow ruffles (Figs. 6A, 11F). Tentacles slight bumps. Appears to posses four lateral intestinal branches. Large sucker mid-body. Cerebral eyespot with about 30 eyes each, tentacular bumps with about 15 eyes each (Fig. 6B). Size range: 4 x 2 mm to 10 x 4 mm (all mature) (see Table 2).

Transparent with a white opaque reticulate pattern (sometimes appears brown if gut diverticula full of food particles) (Fig. 11F, Table 2). Opaque white dots over tentacular bumps and between. Margin clear with white peripheral glands.

Diagnosis. – Transparent with a white opaque reticulate pattern.

Etymology. – Named from the Latin *reticulatus* = netlike, for its distinct white pattern.

Remarks. – This species closely resembles *C. guttatus*, new species, and *C. variegatus*. This species does not possess red dots and there are fewer cerebral and tentacular eyes than in *C. guttatus*, new species (Table 2). It has a distinct white reticulate pattern and about three lateral intestinal branches and it is not variable (yellow, orange or red pigment) with 9 lateral intestinal branches as found in *C. variegatus*.

Habitat & distribution. – Seven animals were found together under a coral boulder feeding on an encrusting brown colonial ascidian that they had nearly consumed. Rare but widely distributed, found from the reef crest from Heron Is., southern GBR; Madang, PNG and Coral Bay, WA.

Cycloporus spiritus, new species
(Figs. 7A, B, 12A)

Material examined. – Holotype - WM (QM G211066) under rubble, reef crest, Heron Is., S GBR, 14 Sep.1989.

Paratype – LS (QM G211088), 10m, under boulders, off Mooloolabah, SE Qld, Aust., coll. K. Jennings, 9 Apr.1996.

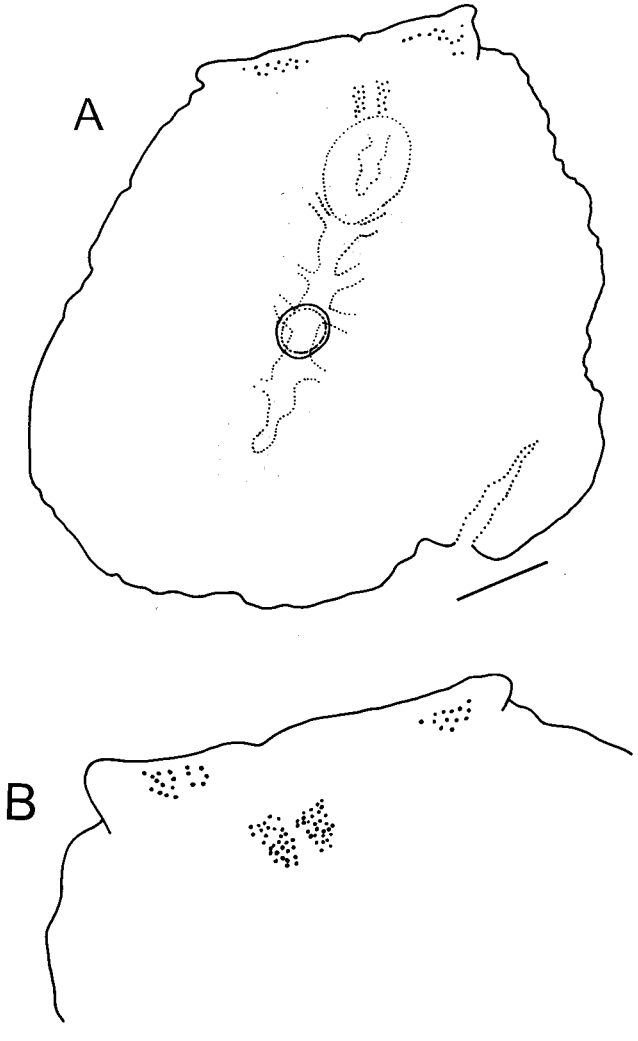

Fig. 6. *Cycloporus reticulatus*, new species. A. Whole mount from the ventral side, bar = 0.5 mm; B. Dorsal eye arrangement.

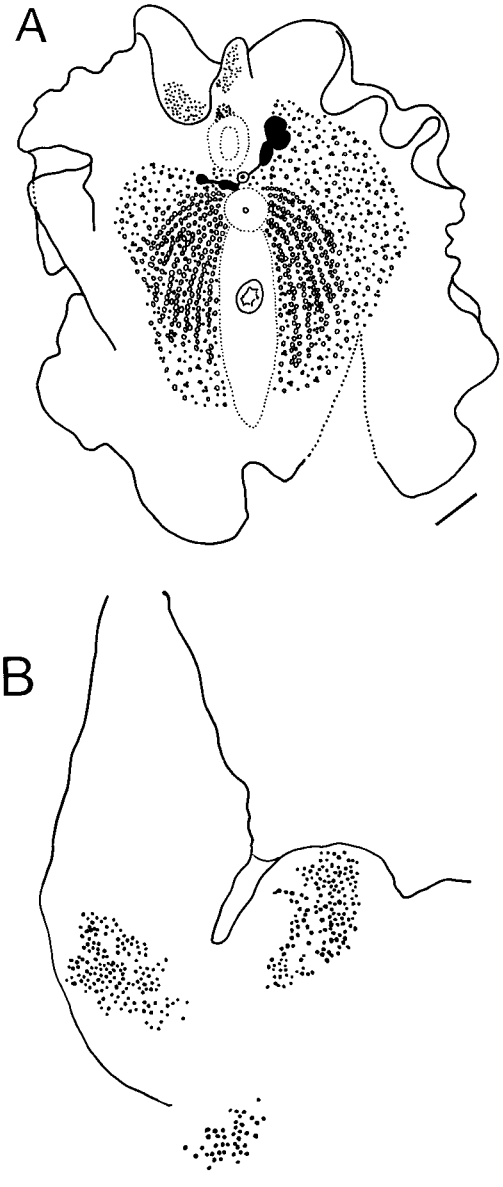

Fig. 7. *Cycloporus spiritus*, new species. A. Whole mount from the ventral side, bar = 1.0 mm; B. Dorsal eye arrangement.

Description. – Rounded oval, margin ruffled, tentacles bumps only (Figs. 7A, 12A). Large sucker. Extensive branching oviducts full of eggs. Elongate cerebral eyespots with about 20 to 25 eyes each; tentacular bumps with numerous eyes, about 150 each (Fig. 7B). Size range: 8 x 4 mm to 15 x 8 mm (mature) (see Table 2).

Transparent white (can appear brown when gut diverticula are full of dark brown pigment), median stripe alternating between opaque white then yellow-orange and ending prior to posterior margin (Fig. 12A, Table 2). Brilliant yellow-orange wide margin, clear rim. Tentacles yellow-orange with white triangular spot in between.

Diagnosis. – White with opaque white and yellow-orange median stripe, margin bright-yellow orange.

Etymology. – Named from the Latin *spiritus* = ghost, for its white, ghost-like appearance.

Remarks. – No other species has so many tentacular eyes except for *C. australis* Prudhoe, 1982 (Tables 1, 2). However, this species is white with a yellow-orange median stripe and yellow-orange marginal band, not brown with brown spots as in *C. australis*.

Distribution & habitat. – Rare from under rubble on the reef crest, Heron Is., S GBR and reef slope, Mooloolabah, SE Qld.

Cycloporus variegatus, Kato, 1934
(Figs. 8A, B, 12B, C)

Cycloporus variegatus Kato, 1934: 123, fig. 15; Dawydoff, 1952: 81.

Material examined. – WM (QM G211209), 2m, under rubble, night, Lizard Is, N GBR, Apr. 7 1995; LS & WM (QM G211063), 1- 2 m, under rocks, Woodman's Point, off Freemantle, WA, coll. L. N & M. Hewitt, 18 Apr.1996.

Description. – Rounded oval (Fig. 8A). Tentacles short and pointed. Intestine with about 9 lateral branches. Sucker large, mid-body. Extensive branching oviducts and cement glands. Two elongate cerebral eyespots with about 70 eyes each, tentacles with about 50 to 60 eyes each (Fig. 8B). Size: 9 x 3mm (mature) (see Table 2).

Transparent cream, can appear brown when gut diverticula full of food; entire dorsal surface with evenly distributed yellow spots; opaque white spot just posterior to the cerebral eyespot, intermittent median yellow stripe (or irregular elongate spots) ending prior to the posterior margin (Figs. 12B, C). Tentacles yellow. Margin clear with yellow peripheral glands . Ventrally transparent cream.

Diagnosis. – Transparent cream, covered in yellow spots with median white and intermittent yellow stripe and short pointed tentacles; nine lateral intestinal branches.

Remarks. – Specimens match the original description given by Kato (1934). Kato (1943) did not mention the number of lateral intestinal branches in his specimen so comparisons cannot be made (see Table 1, 2).

Habitat & distribution. – Rare from under rubble, Lizard Is., N GBR and Freemantle, WA. Also known from Japan (Kato, 1934, 1937) and Vietnam (Dawydoff, 1952).

Cycloporus venetus, new species
(Figs. 9A-C, 12D)

Material examined. – Holotype - WM (QM G211203), 3 m, N. Exmouth, WA, 24 Apr.1996.

Description. – Rounded oval (Figs. 9A, 12D). Tentacles only slight bumps. Cerebral eyespots with about 30 eyes each and about 15 scattered tentacular eyes (Fig. 9B). Size 8 x 3 mm (mature) (see Table 2).

Bright opaque blue with a narrow white median stripe (Fig. 12D). Margin wide, opaque light yellow, rim clear. Tentacles with a small black spot (Fig. 9B).

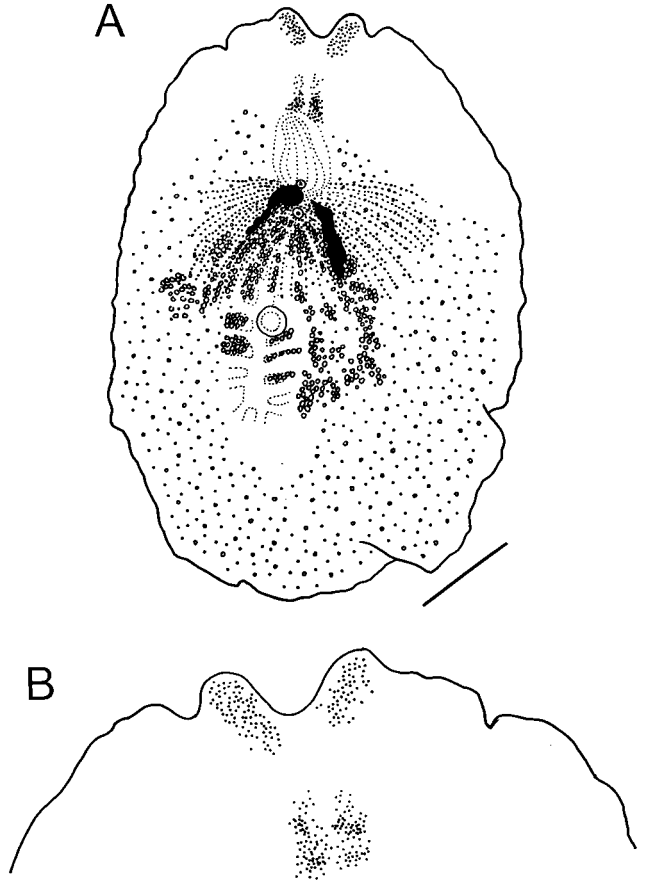

Fig. 8. *Cycloporus variegatus* Kato, 1934. A. Whole mount from the ventral side, bar = 1.0 mm; B. Dorsal eye arrangement.

Diagnosis. – Blue with narrow median white stripe and wide yellow margin, tentacular bumps with a black spot.

Etymology. – Named from the Latin *venetus* = sea-blue, for its blue colour and yellow margin which resembles a sandy beach.

Remarks. – No other *Cycloporus* has such a unique colour pattern.

Habitat & distribution. – Rare from Exmouth, WA.

Cycloporus xanthopunctatus, new species
(Figs. 10A-C)

Material examined. – Holotype - WM (QM G211208), 12 m, under boulders, N Stradbroke Is., Moreton Bay, SE Qld., 7 Apr.1996.

Description. – Body elongate oval (Figs. 10A, B). Dorsal surface covered in regularly spaced papillae. Cerebral eye clusters with about 45 eyes each, tentacular bumps with about 25 eyes each (Fig. 10B). Size: 10 x 6 mm (mature) (Table 2).

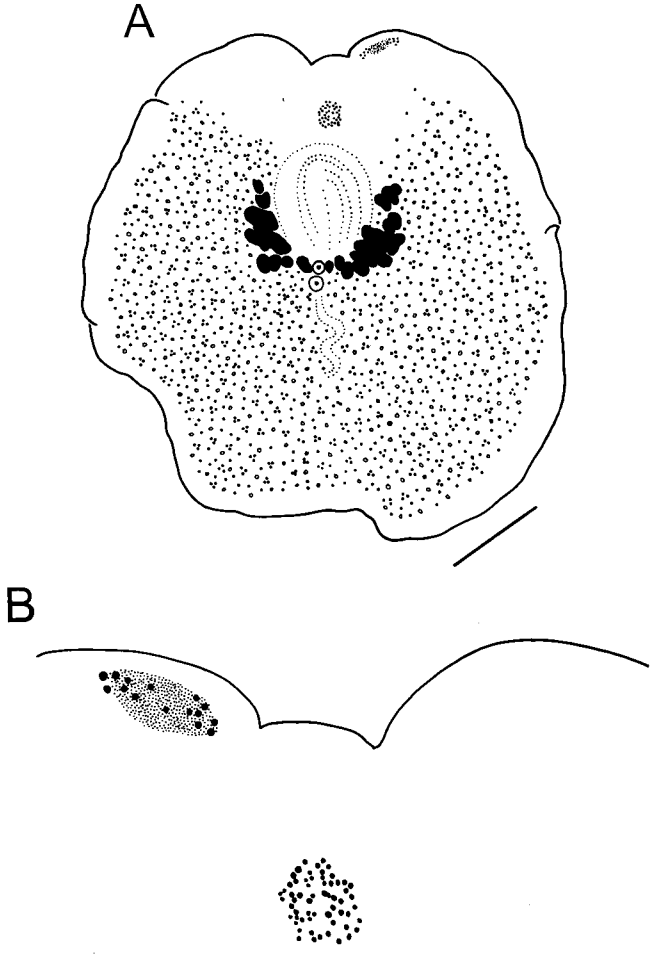

Fig. 9. *Cycloporus venetus*, new species. A. Whole mount from the ventral side, bar = 1.0 mm; B. Dorsal eye arrangement.

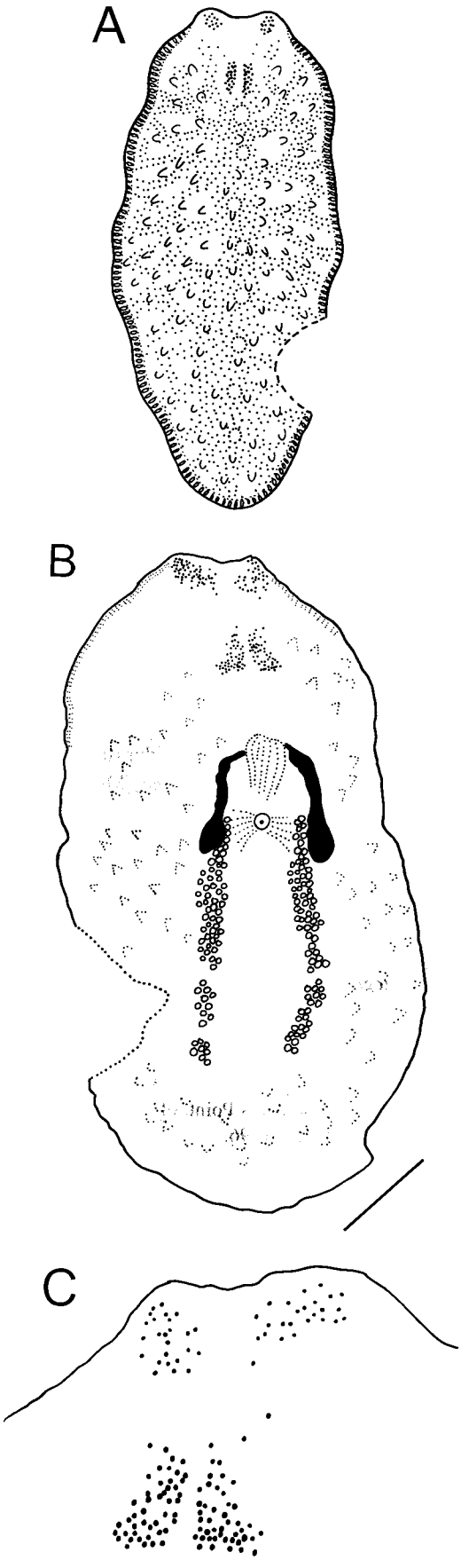

Fig. 10. *Cycloporus xanthopuncatus*, new species. A. Diagram of dorsal pattern showing papillae and darker pigment granules; B. Whole mount from the ventral side, bar = 1.0 mm; C. Dorsal eye arrangement.

Transparent brown, covered with bright yellow spots, median line of yellow spots, can appear red-brown when gut diverticula full of food particles (Fig. 10A). Margin clear with yellow peripheral glands.

Diagnosis. – Papillate, transparent with yellow spots and yellow median stripe.

Etymology. – Named from the Greek *xanthos* = yellow and Latin *punctum* = dot for its yellow spots.

Remarks. – Although no colour photograph is available, there is adequate information to determine that this is a new species. Only two other species are papillate, *C. albofasciatus*, new species, and *C. papillosus* (Tables 1, 2). This current species possesses yellow spots, not white transverse streaks as found in *C. albofasciatus*, new species. Furthermore, it does not have numerous cerebral and tentacular eyes as found in *C. papillosus*. It is possible that *C. papillosus* s. s. may represent several species since its distribution from cold temperate seas to tropical seas is unusually broad. Obviously more specimens are needed for study.

Habitat & distribution. – Rare from under boulders, reef slope, Moreton Bay, SE Qld, Australia.

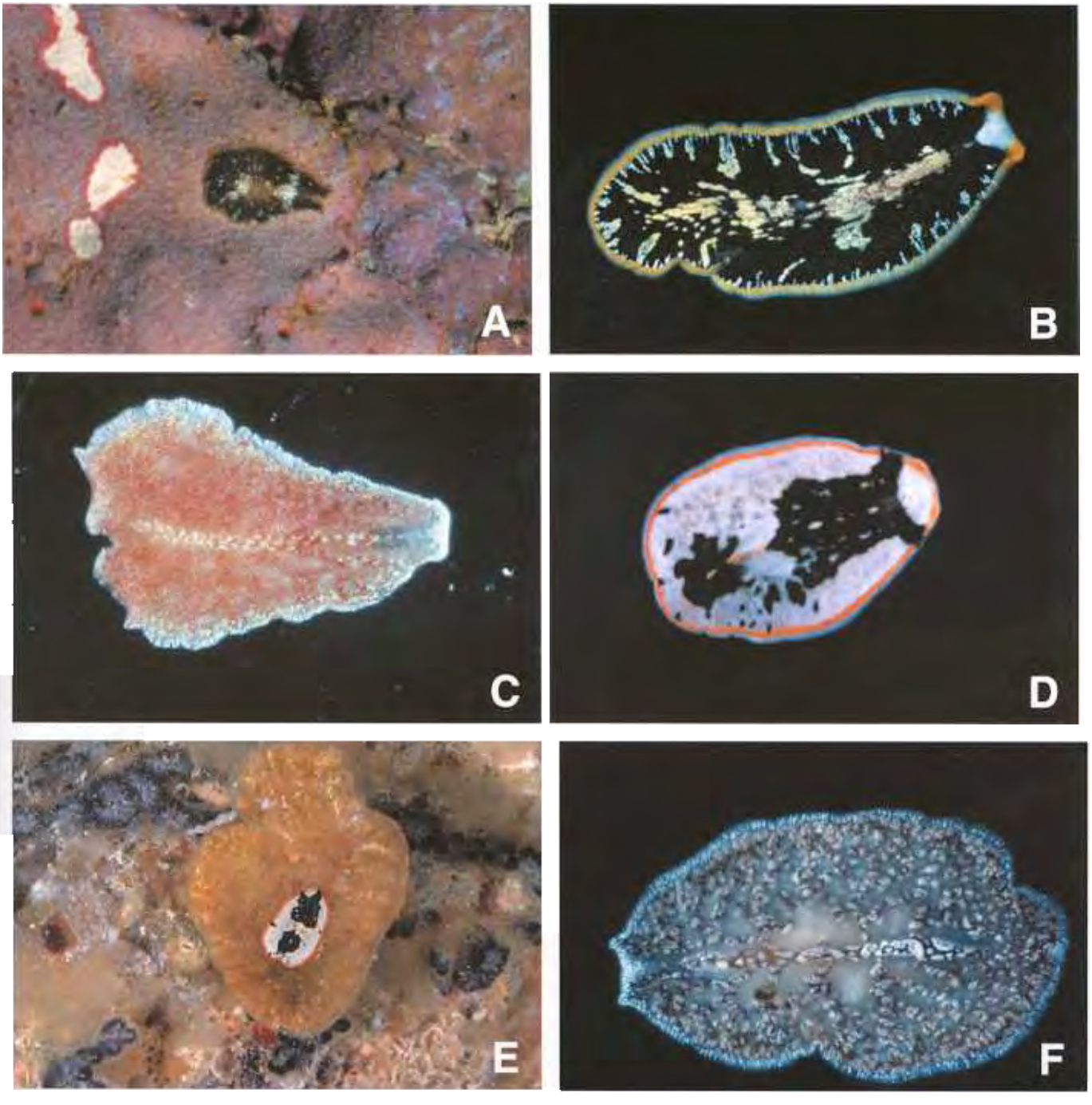

Fig. 11. A. *Cycloporus albofasciatus*, new species, Madang, PNG; B. *Cycloporus atratus*, new species, Heron Is., S GBR; C. *Cycloporus guttatus*, new species, Heron Is., S GBR; D. *Cycloporus harlequin* new species, Heron Is., S GBR; E. *C. harlequin*, new species, *in situ* on a colonial ascidian, Heron Is., S GBR; F. *Cycloporus reticulatus*, new species, Heron Is., S GBR.

DISCUSSION

It is apparent that flatworms belonging to the family Euryleptidae are more common than previously thought. In general, these polyclads are smaller than the more conspicuous pseudocerotids and may have been overlooked. Furthermore, several of these animals were found closely associated with their prey, colonial ascidians, and have not been found roaming about like the larger pseudocerotids.

Identification of *Cycloporus* species has proven to be problematic since there are few reliable taxonomic characters. It appears that pattern is the most reliable character available to separate species, however, the colour of animals varies depending on what they consume. Many animals appeared to be generally dark brown owing to the dark brown food particles in the gut diverticula. The relative number of cerebral and tentacular eyes is also a useful character to differentiate some species although the exact number of eyes was found to vary intra-specifically. The reliability of the number of lateral intestinal branches as a taxonomic character is questionable: they were extremely hard to see in the wholemounts especially if the animals were sexually mature and full of eggs in the swollen, branching oviducts. Details of the reproductive anatomy have not been given here as there is no information from the previous literature for comparison.

Obviously, more information is needed on these elusive polyclads to better understand their biodiversity and distribution.

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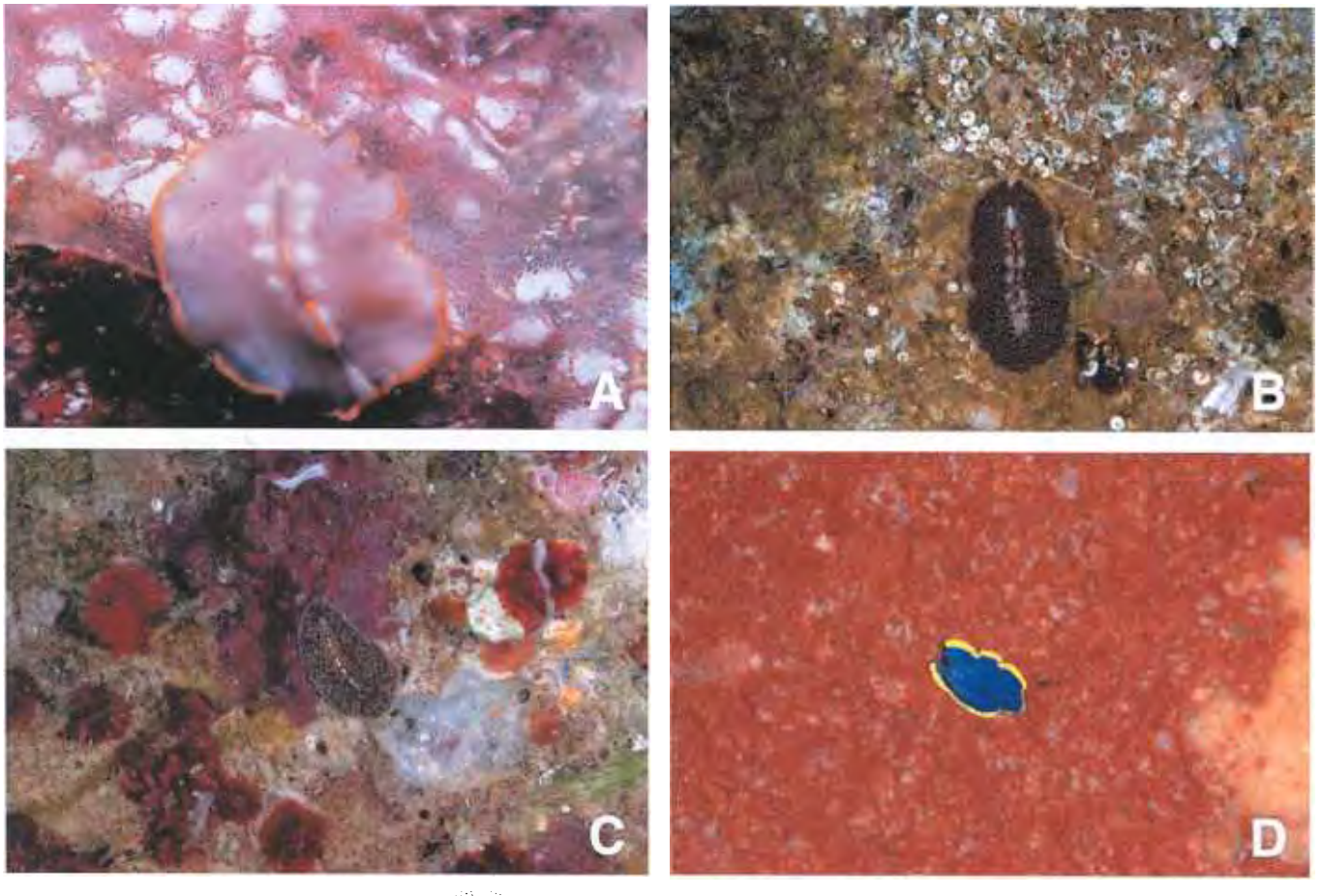

Fig. 12. A. *Cycloporus spiritus*, new species, Heron Is., S GBR; B. *Cycloporus variegatus* Kato 1934, Lizard Is., N GBR; C. *Cycloporus variegatus* Kato, 1934, Ningaloo Reef, WA; D. *Cycloporus venetus*, new species, Exmouth, WA.

Table 1. Morphological features of known *Cycloporus* spp. (after Faubel, 1984; Prudhoe, 1985; Marcus & Marcus, 1968).

Species	Dorsal Surface	Max. Size mm	Colour Pattern	Margin	Tentacles	Cerebral eyespots	No. tent. eyes	No. lateral intestinal branches	Location
C. australis Prudhoe, 1982	smooth	10 x 7	brown with dark spots	yellow spots	indefinite	2x long as wide, numerous	numerous	8 or 9	South Australia
C. gabrielle Marcus, 1950	smooth	10	pink/gray with dark spots	smooth	short and pointed	3x long as wide	2 ventral groups of ~20, 2 dorsal of ~10	9	Caribbean
C. maculatus Hallez, 1893	slightly papillate	10 x 7	variable from yellow, orange to red	smooth, inner red and outer white band	short & pointed	numerous*	numerous	7	Mediterranean, Ireland
C. misakiensis Kato, 1939	smooth	20	brown, darker spots	dark spots	rudimentary	laterally wide	numerous	?	Japan
C. papillosus Lang, 1884	papillate	16 x 9	cream, papillate white, yellow or orange	ruffled	short &	scattered & pointed	scattered & numerous*	6 numerous	Japan, Sweden, Vietnam, UK, South Africa
C. variegatus Kato, 1934	smooth	11 x 6	median brown line, white specks	ruffled, yellow spots	short & pointed	numerous, 2 contiguous groups	numerous, especially ventrally	figure shows 4	Japan, Vietnam

* see text

Table 2. Morphological features of eight new species of *Cycloporus* and a redescription of *C. variegatus* Kato, 1934 from Australasian waters.

Species	Dorsal Surface	Max. Size mm	Colour Pattern	Margin	Tentacles	No. cerebral eyes per side	No. tent. eyes per side	No. intestial branches	Location
C. albofasciatus, new species	papillate	7 x 4	brown, white transverse streaks & flecks	clear	bumps	30	15 - 20 scattered	4 or 5	Madang
C. atratus, new species	smooth	8 x 5	black, yellow blotches	yellow	orange & white bumps	10	10 scattered	?	south GBR
C. *guttatus*, new species	smooth	4 x 3	cream with red dot	clear	bumps	50 - 70	20	4?	south GBR
C. harlequin, new species	smooth	10 x 7	white with black patches	orange, rim clear	yellow bumps	15 - 20	10 - 15	?	south GBR
C. reticulatus, new species	smooth	20 x 10	cream with white reticulate pattern	clear	white bumps	30	15	4	S GBR, SE Qld, Madang, WA
C. spiritus, new species	smooth	15 x 10	white, median yellow & orange stripe	orange	orange bumps	20 - 25	150	?	south GBR
C. *variegatus* Kato, 1934	smooth	20 x 10	cream, median orange stripe, white dots	yellow spots, ruffled	pointed	70	50 - 60	9	north GBR WA
C. venetus, new species	smooth	8 x 3	bright blue, median white	wide yellow	orange bumps	30	15 scattered	?	WA
C. xanthopunctatus, new species	papillate	10 x 6	brown, median yellow spots	yellow spots	bumps	45	25	?	SE Qld

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