

## *Chrysiptera albata*, a new species of damselfish (Pomacentridae) from the Phoenix Islands, Central Pacific Ocean

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Accepted: 16.09.2002

### Keywords

Taxonomy, marine fishes, *Chrysiptera*, new species, Pomacentridae, Central Pacific Ocean

### Abstract

A new species of pomacentrid, *Chrysiptera albata*, is described from 3 specimens, 22.0-27.8 mm SL, collected during a marine biological expedition to the Phoenix Islands in 2002. It is closely related to *C. caeruleolineata* from the western Pacific and eastern Indian Ocean, but differs markedly in colour pattern. In contrast to *C. caeruleolineata*, which is pale yellowish with a bright blue neon stripe on the upper head and body, it is mainly white with a slight bluish cast. Possible modal differences were also detected with relation to number of gill rakers on the first branchial arch and number of lateral line scales. However, additional specimens of *C. albata* are needed for confirmation.

### Zusammenfassung

Eine neue Pomacentriden-Art, *Chrysiptera albata*, wird beschrieben von 3 Exemplaren, 22.0-27.8 mm SL, gefangen während einer Marinen Biologischen Expedition zu den Phoenix Inseln in 2002. Die Art ist nahe Verwand mit *C. caeruleolineata* aus dem westlichen Pazifik und östlichen Indischen Ozean, aber unterscheidet sich erheblich im Farbmuster. Im Unterschied zu *C. caeruleolineata*, mit seinem schwach gelblichen Körper und einem stark leuchtenden Neonstreifen vom Kopf über die obere Körperhälfte, ist die neue Art überwiegend weiß bis zart hellbläulich. Möglicher modaler Unterschied konnte auch in der Relation der Anzahl der Kiemenrechen auf dem ersten Kiemenbogen und in der Zahl der Laterallinenschuppen gefunden werden. Aber dafür sind weitere Exemplare von *C. albata* nötig um dies zu bestätigen.

### Résumé

Une nouvelle espèce de pomacentridé, *Chrysiptera albata*, est décrite à partir de 3 spécimens, 22,0 - 27,8 mm. SL, collectés au cours d'une expédition biologique marine aux Iles Phoenix en 2002. Cette espèce est proche de *C. caeruleolineata* du Pacifique

occidental et de l'océan indien oriental mais diffère surtout par le patron de coloration. Contrairement à *C. caeruleolineata* qui est jaunâtre pâle avec une bande bleu néon brillante sur le dessus de la tête et du corps, il est principalement blanc avec une légère crête bleutée. De possibles différences modales ont aussi été détectées au niveau du nombre de branchiospines sur le premier arc branchial et du nombre d'écaillés sur la ligne latérale. Cependant, des spécimens supplémentaires de *C. albata* sont nécessaires pour confirmation.

### Sommario

Una nuova specie di pomacentride, *Chrysiptera albata*, viene descritta sulla base di 3 esemplari, di 22.0-27.8 mm SL, raccolti durante una spedizione biologica alle Isole Phoenix nel 2002. Si tratta di una specie vicina a *C. caeruleolineata* del Pacifico occidentale e Oceano Indiano orientale, ma differisce marcatamente per la livrea. Diversamente da *C. caeruleolineata*, che è di un giallo pallido con una stria longitudinale blu brillante sulla parte superiore del capo e sul corpo, la nuova specie è fondamentalmente bianca con una leggera gettata bluastra. Sono state misurate anche differenze modali nel numero dei rastrelli branchiali del primo arco e nel numero di scaglie in linea laterale. Tuttavia, altri esemplari di *C. albata* sono necessari per confermare queste differenze.

### Introduction

Damselfishes are among the most numerous of coral reef inhabitants, occurring in nearly every reef-associated habitat situation. Allen (1991) reviewed the family, which at the time consisted of 321 species in 28 genera. Since then, an additional 30 species have been described or descriptions are currently in press. The majority, or about 83 percent of the species, are distributed on reefs of the vast Indo-west and central Pacific region, with the largest concentrations in Indonesia (152 species) and Australia (140 species).

The present paper describes a new *Chrysiptera* recently collected by the authors at Nikumaroro Atoll in the Phoenix Islands in the central Pacific Ocean. The

expedition was sponsored by the Department of Conservation of the New England Aquarium, and entailed 25 days of biological survey work at this remote island group. The new species was sighted during one of the last dives of the trip, while exploring the steep outer slope on the windward side of the atoll.

The genus *Chrysiptera* comprises an assemblage of small, often brightly- coloured damselfishes, which were formerly part of the genus *Abudefduf* (see Allen, 1991). Although further genetic-based study is required to confirm its monophyletic integrity, the genus as presently defined contains 29 species (Table I). Most of the recognized species possess 13 dorsal spines, but the new discovery and its closest relative, *C. caeruleolinata* (Allen, 1973) are unique in having 14 spines.

### Materials and Methods

The methods of counting and measuring are the same as those described by Allen (1972) except the length of the dorsal and anal spines are measured proximally from the base of the spine rather than from the point where the spine emerges from the scaly sheath. Gill-raker count is a total of upper and lower-limb elements on the first branchial arch. The last dorsal and anal soft ray is split at the base and is counted as a single element. The fraction "1/2" appearing in the scale count above the lateral line refers to a small truncated scale at the base of the dorsal fin.

Counts and proportions appearing in parentheses apply to the paratypes. Proportional measurements expressed in thousandths of the standard length are provided in Table II. Type specimens have been deposited at the Western Australian Museum, Perth (WAM).

### *Chrysiptera albata* n. sp. (Figs 1-2)

**Holotype:** WAM P.32109-001, 27.8 mm SL, Nikumaroro (Gardner) Island, Phoenix Islands, outer reef on north-eastern side (4° 40.008' S, 174° 30.905' W), 42-45 m, quinaldine sulphate, collected by G. Allen and S. Bailey, 4 July 2002.

**Paratypes** (collected with holotype): WAM P.32109-002, 2 specimens, 22.0-25.2 SL.

### Diagnosis

A species of the pomacentrid genus *Chrysiptera* with the following combination of characters: dorsal rays XIV,12; anal rays II,13; pectoral rays 15-16; gill rakers on first branchial arch 5 or 6 + 19 or 20, total rakers 19 or 20; tubed lateral line scales 15 or 16; colour in life whitish overall, without distinguishing markings.

### Description

Dorsal rays XIV,12; anal rays II,13; pectoral rays 15 (16); gill rakers on first branchial arch 6 + 14 (5 or 6

+14), total rakers 20 (19 or 20); lateral line scales with tubes 16 (15); vertical scale rows 27; scales above lateral line to base of middle dorsal spines 1 1/2; scales below lateral line to anus 7.

Body depth 2.6 (2.5-2.7) in standard length; maximum body width 2.4 (2.9) in depth; head length contained 3.3 (3.0-3.1) in standard length; snout 5.3 (5.3-5.5), eye 2.4 (2.4-2.5), interorbital width 5.0 (4.6-4.9), least depth of caudal peduncle 2.2 (2.4- 2.6), length of caudal peduncle 2.4 (2.2), all in head length.

Mouth oblique, terminal, the maxillary reaching to a vertical slightly beyond anterior edge of eye; teeth of jaws uniserial, conical in shape, about 42 teeth in lower jaw and 38 in upper; pair of small nasal openings on each side of snout, barely distinguishable from surrounding sensory pores; preorbital and sub-orbital relatively narrow, the greatest depth about 2.6 in pupil diameter, the ventral margin smooth; margins of preopercle and opercular series smooth.

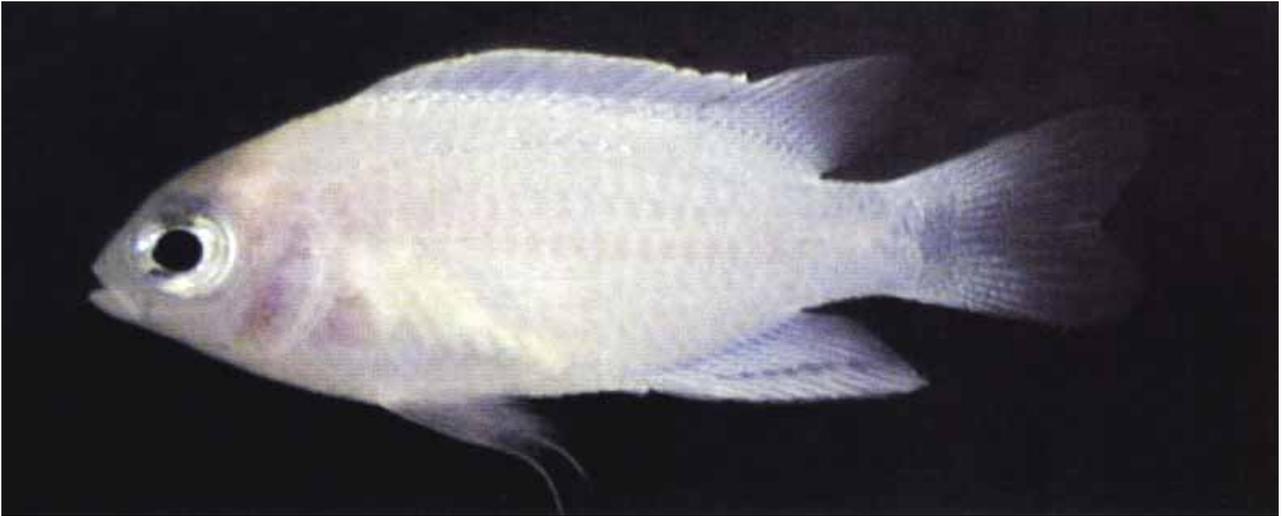
Scales of head and body finely ctenoid; preorbital, suborbital, snout tip, lips, chin, and isthmus naked; preopercle with 2 scale rows, rear margin narrowly naked; dorsal and anal fins with a basal scaly sheath; proximal two-thirds of caudal fin covered by scales; paired fins covered by scales only at base; axillary scale of pelvic fins about two-thirds length of pelvic spine.

Tubed lateral line scales ending below posterior spines of dorsal fin; pits or pores present on 4 scales immediately posterior to last tubed lateral line scale; a series of 8 (7-9) pored or pitted scales mid-laterally on caudal peduncle to caudal base.

Origin of dorsal fin at level of second or third tubed scale of lateral line; spines of dorsal fin gradually increasing in length to about sixth or seventh spine, remaining spines about equal in length; membrane between spines not incised; first dorsal spine 5.3 (6.2-6.3), second dorsal spine 3.5 (4.1), both in head length; sixth dorsal spine 1.9 (2.0-2.3) in head; longest (fifth) soft dorsal ray 1.9 (1.6-1.9) in head; length of dorsal fin base 1.7 (1.6-1.7) in standard length; first anal spine 6.1 (6.3-6.7), second anal spine 2.2 (2.5), both in head length; longest soft anal ray 1.5 (1.6) in head; base of anal fin 2.4 (2.3-2.4) in base of dorsal fin; caudal fin slightly emarginate, its length 3.5 (3.2-3.5) in standard length; pectoral fin reaching a vertical through origin of anal fin, the longest ray 1.0 (1.0 -1.1) in head length; first soft ray of pelvic fin with filamentous tip (damaged in paratypes), just reaching origin of anal fin, pelvic fin length 1.1 (1.1-1.3) in head length.

**Colour in alcohol:** holotype overall yellowish white except slightly brownish on forehead and small cluster of pepper-like melanophores on uppermost pectoral fin base. The paratypes are similar except they are overall white, without a yellowish hue.

**Colour in life:** (from 35 mm colour transparency, see Fig. 2): overall white with very pale bluish hue, except grey on forehead and tiny grey spot on upper-



**Fig. 1.** *Chrysiptera albata*, holotype, 27.8 mm SL, Nikumaroro Atoll, Phoenix Islands.



**Fig. 2.** Underwater photograph of *C. albata*, approximately 30 mm SL, Nikumaroro Atoll, Phoenix Islands.



**Fig. 3.** Underwater photograph of *C. caeruleolineata*, approximately 35 mm SL, Madang, Papua New Guinea.

**Table I.** Species of *Chrysiptera* and their general distributions.

SPECIES	DISTRIBUTION
<i>Chrysiptera albata</i> Allen & Bailey, new species	Phoenix Islands
<i>Chrysiptera annulatus</i> (Peters, 1855)	Red Sea & W. Indian Ocean
<i>Chrysiptera biocellata</i> (Quoy & Gaimard, 1824)	Indo-West Pacific
<i>Chrysiptera brownriggii</i> Bennett, 1828*	Indo-West Pacific
<i>Chrysiptera bleekeri</i> (Fowler & Bean, 1928)	Indonesia & Philippines
<i>Chrysiptera caeruleolineata</i> (Allen, 1973)	Eastern Indian Ocean & W. Pacific
<i>Chrysiptera cyanea</i> (Quoy & Gaimard, 1824)	Eastern Indian Ocean & W. Pacific
<i>Chrysiptera cymatilis</i> Allen, 1997	Eastern Papua New Guinea
<i>Chrysiptera flavipinnis</i> (Allen & Robertson, 1974)	South-western Pacific
<i>Chrysiptera galba</i> (Allen & Randall, 1974)	South-eastern Pacific
<i>Chrysiptera glauca</i> (Cuvier, 1830)	Indo-West Pacific
<i>Chrysiptera hemicyanea</i> (Weber, 1913)	E. Indonesia & Timor Sea
<i>Chrysiptera kuiteri</i> Allen & Rajasuriya, 1995	Eastern Indian Ocean to Bali
<i>Chrysiptera niger</i> (Allen, 1975)	Eastern Papua New Guinea
<i>Chrysiptera notialis</i> (Allen, 1975)	South-western Pacific
<i>Chrysiptera oxycephala</i> (Bleeker, 1877)	Indo-Melanesian Archipelago
<i>Chrysiptera parasema</i> (Fowler, 1918)	Western Pacific
<i>Chrysiptera pricei</i> Allen & Adrim, 1992	Northern Irian Jaya
<i>Chrysiptera rapanui</i> Greenfield & Hensley, 1970	Kermadec Is. & Easter I.
<i>Chrysiptera rex</i> (Snyder, 1909)	Eastern Indian Ocean & W. Pacific
<i>Chrysiptera rollandi</i> (Whitley, 1961)	Indo-Australian Archipelago
<i>Chrysiptera sinclairi</i> Allen, 1987	Bismarck Archipelago
<i>Chrysiptera springeri</i> (Allen & Lubbock, 1976)	Indonesia & Philippines
<i>Chrysiptera starcki</i> (Allen, 1973)	Western Pacific
<i>Chrysiptera talboti</i> (Allen, 1975)	Indo-Australian Archipelago
<i>Chrysiptera taupou</i> (Jordan & Seale, 1916)	South-western Pacific
<i>Chrysiptera traceyi</i> (Woods & Schultz, 1960)	Marshall & Caroline Islands
<i>Chrysiptera tricineta</i> (Allen & Randall, 1974)	Western Pacific
<i>Chrysiptera unimaculata</i> Cuvier, 1830	Indo-West Pacific
* <i>C. leucopoma</i> (Lesson, 1830) is a junior synonym	

most pectoral fin base.

### Remarks

This species is most closely related to *Chrysiptera caeruleolineata* (Allen, 1973), which is widespread in the western Pacific and eastern Indian Ocean. Collection localities include Rowley Shoals (Western Australia), New Guinea, Coral Sea, Solomon Islands, Guam; Fiji, Samoa, and the Ryukyu Islands. The two species are unique in the genus *Chrysiptera* in possessing 14 dorsal spines (the rest have 13 spines). They are also the deepest dwelling and the smallest (usually under about 38 mm SL) members of the genus. *Chrysiptera caeruleolineata* differs markedly in having an overall pale yellow coloration with a bright neon blue stripe along the top of the head and body (Fig. 3). Although the two species share most meristic and proportional features, there are possible modal differences in the number of total gill rakers and lateral line scales. Allen (1973) reported that *C. caeruleolineata* had 20-23 total rakers on the first branchial arch with 80 percent of specimens with a count of 21-22, and 12-15 lateral line scales with 80 percent of specimens with 12-14. In contrast, *C. albata* has 19-20

total rakers and 15-16 lateral line scales. Obviously, additional specimens of *C. albata* would be desirable in order to verify these possible differences.

The habitat of both *C. albata* and *C. caeruleolineata* consists of sand and rubble bottoms of steep outer reef slopes at depths below 30 m. In the Phoenix Islands, *C. albata* was encountered only at one site on the windward side of Nikumaroro Atoll. Numerous individuals in loose aggregations were observed in 40-55 m depth, in gullies that dissected the steep slope. They were invariably sighted close to the bottom, quickly retreating into holes among the rubble when approached closely. The largest individual observed was estimated to be about 35 cm SL.

### Etymology

The species is named *albata* (Latin "clothed in white") with reference to the overall coloration, its most distinctive feature.

### Acknowledgements

We are greatly indebted to Greg Stone, organizer of the Phoenix Islands Expedition 2002, for inviting us to participate. The first author's involvement was facili-

**Table II.** Proportional measurements of type specimens of *Chrysiptera albata* as percentage of the standard length.

Character	Holotype WAM P.32109 -001	Paratype WAM P.32109 -002	Paratype WAM P.32109 -002
Standard length (mm)	27.8	25.2	22.0
Body depth	38.5	37.3	39.5
Body width	16.2	12.7	13.6
Head length	30.6	32.5	33.6
Snout length	5.8	6.0	6.4
Orbit diameter	12.6	13.1	14.1
Interorbital width	6.1	7.1	6.8
Upper jaw length	7.9	8.3	8.6
Caudal peduncle depth	13.7	12.7	14.1
Caudal peduncle length	12.6	14.7	15.0
Predorsal length	36.7	36.9	36.4
Preanal length	64.4	64.7	65.5
Prepelvic length	38.1	36.9	37.7
Length dorsal fin base	58.3	59.5	60.9
Length anal fin base	24.5	25.8	25.0
Length pectoral fin	30.2	33.3	31.4
Length pelvic fin	26.6	29.4	25.5
Length pelvic spine	13.7	17.1	15.0
Length 1st dorsal spine	5.8	5.2	5.5
Length 2nd dorsal spine	8.6	7.9	8.2
Length 6th dorsal spine	12.9	12.7	13.6
Length longest dorsal ray	16.2	20.2	17.3
Length 1st anal spine	5.0	5.2	5.0
Length 2nd anal spine	13.7	13.1	13.6
Length longest anal ray	19.8	19.8	20.9
Length caudal fin	28.8	28.6	31.4

tated by Anthony Rylands and Timothy Werner of Conservation International. We are also grateful to David Obura, science team leader of the Phoenix Expedition, and Mary Jane Adams, for help with collections. Cat Holloway contributed valuable video footage of the new species and 35 mm shipboard photography was assisted by Paul Nicklen and Joe Stancampiano of the National Geographic Society.

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