Cirrhilabrus nahackyi, a new wrasse (Perciformes; Labridae) from the South Pacific

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Received: 20 May 2011 – Accepted: 6 July 2011

Abstract

Cirrhilabrus nahackyi, a new species of labrid fish found at Viti Levu, Fiji, and at Tongatapu in Tonga is described from five specimens, 30.9-65.0 mm SL, captured in 35-50 m depths on outer reef slopes. The new species closely resembles *C. bathyphilus* from the Coral Sea. However, terminal males differ in having an elevated pennant at the first and second dorsal spine. The male coloration of *C. nahackyi* also differs with regards to the dorsal and caudal fins. The spinous part of the dorsal fin is dusky yellow and lacks a violet band, while the soft portion of this fin has a distinctive yellow base, and larger red mid-dorsal band, which is not present in *C. bathyphilus*. Additionally, the caudal fin of the new species is red with only a thin submarginal black line in the upper half of the fin in terminal males compared to a yellow caudal fin in *C. bathyphilus*, which has blue blotches on the membrane in the upper part and has a broader black submarginal band extending the entire depth of the fin. The dorsal fin of the new species is also slightly longer than that of *C. bathyphilus*.

Zusammenfassung

Die neue Lippfisch-Art *Cirrhilabrus nahackyi* wird auf der Grundlage von fünf Exemplaren mit 30,9-65,0 mm SL beschrieben, die in 35-50 m Tiefe über äußeren Riffhängen bei Viti Levu, Fidschi-Inseln, und bei Tongatapu in Tonga gefangen wurden. Diese neue Art ähnelt stark *C. bathyphilus* von den Korallenmeer-Inseln. Doch unterscheiden sich die ausgewachsenen Männchen durch einen aufragenden Wimpel am ersten und zweiten Rückenflossenstrahl. Auch unterscheidet sich die Farbgebung der Männchen von *C. nahackyi* an Rücken- und Schwanzflosse. Der dornartige Teil der Rückenflosse zeigt ein trübes Gelb, aber kein violettes Band; der weiche Teil dieser Flosse hingegen weist eine deutlich gelbe Basis auf sowie ein größeres rotes Band im mittel-dorsalen Bereich, das bei *C. bathyphilus* fehlt. Außerdem ist die Schwanzflosse der neuen Art rot mit einer nur dünnen submarginalen schwarzen Linie in der oberen Hälfte bei ausgewachsenen Männchen; *C. bathyphilus* hingegen hat eine gelbe Schwanzflosse mit blauen Flecken auf der Membran im oberen Teil und einem breiteren schwarzen submarginalen Band, das sich über die ganze Tiefe der Flosse erstreckt. Die Rückenflosse der neuen Art ist auch ein wenig länger als bei *C. bathyphilus.*

Résumé

Cirrhilabrus nahackyi, une nouvelle espèce de labre découverte à Viti Levu, Fidji et à Tongatapu, Tonga, est décrite sur base de cinq spécimens, de 30,9-65,0 mm SL, capturée à une profondeur de 35-50 m sur des tombants récifaux du large. La nouvelle espèce ressemble de près à *C. bathyphilus* de la Mer de Corail. Néanmoins, les mâles adultes se distinguent par une haute excroissance sur la première et la deuxième épine dorsale. La coloration du mâle de *C. nahackyi* diffère aussi pour ce qui concerne les nageoires dorsale et caudale. La partie dure de la dorsale est d'un jaune sale et n'a pas de bande violette alors que la partie molle de cette nageoire a une base jaune nette et une plus large bande à mi-nageoire, ce qui n'existe pas chez *C. bathyphilus.* En outre, la caudale de la nouvelle espèce est rouge avec seulement une fine ligne noire submarginale dans la moitié supérieure de la nageoire chez les mâles adultes alors que la caudale de *C. bathyphilus* est jaune, avec des taches bleues sur la membrane dans la partie supérieure, et a une bande submarginale noire plus large qui s'étend sur toute la nageoire. La dorsale de la nouvelle espèce est aussi un peu plus longue que celle de *C. bathyphilus.*

Sommario

Cirrhilabrus nahackyi, una nuova specie di labride rinvenuta a Viti Levu, Fiji e a Tongatapu a Tonga, è descritta sulla base di cinque esemplari di 30.9-65.0 mm SL, catturati a 35-50 m di profondità sul versante esterno della barriera. La nuova specie è molto somigliante a *C. bathyphilus* del Mar dei Coralli. Tuttavia, i maschi terminali differiscono per avere un'estensione a guisa di bandierina sulla prima e sulla seconda spina dorsale. Il maschio di *C. nahackyi* differisce inoltre per la colorazione delle pinne dorsale e caudale. La parte spinosa della dorsale è di color giallo opaco e manca della banda violetta, mentre la parte molle ha una base gialla ben evidente e una banda rossa mediana più larga che non è presente in *C. bathyphilus.* In

aggiunta, la pinna caudale della nuova specie è rossa con una sottile linea nera submarginale nella metà superiore della pinna rispetto ad una pinna caudale gialla in *C. bathyphilus*, che possiede macchie blu sulla membrana della parte superiore e ha una banda submarginale nera più ampia che si estende per tutta l'altezza della pinna. La dorsale della nuova specie è inoltre leggermente più lunga di quella di *C. bathyphilus.*

INTRODUCTION

The labrid genus *Cirrhilabrus* Temminck & Schlegel, 1845 contains small, colorful and sexually dimorphic coral-reef fishes that range across the tropical and subtropical Indo-Pacific region. Prior to 1958, only the following species were known: *C. cyanopleura* (Bleeker, 1851), *C. temminckii* Bleeker, 1853a, *C. jordani* Snyder, 1904, and *C. exquisitus* Smith, 1957. Four additional species, including *C. solorensis* Bleeker, 1853b, *C. heterodon* Bleeker, 1871, and *C. lyukyuensis* Ishikawa, 1904, have generally been regarded as synonyms. However, some authors now recognize *C. solorensis* as a valid species (Allen & Randall 1996; Allen & Kuiter 1999; Parenti & Randall 2000). In a recent paper describing *C. beauperryi* from Papua New Guinea, Allen et al. (2008) noted that the genus contains 46 valid species. Since then Randall and Tanaka (2009) added *Cirrhilabrus naokoae* from Indonesia as the 47th species making *Cirrhilabrus* the second most speciose genus in the family. At present only *Halichoeres* contains more species, Parenti & Randall (2011) noted 80 species, although a recent molecular study has cast doubt on the generic placement of several species presently included in *Halichoeres* (Barber et al. 2005). Reallocation of some of these species to other genera may result in *Cirrhilabrus* being the largest genus of Labridae.

Allen et al. (2003) attributed many discoveries of new *Cirrhilabrus* over the past 30 years to the development and availability of SCUBA equipment for scientific diving. Some of the more recently described species occur below 40-50 m. New technology involving mixed-gas and rebreather diving equipment has made these deeper habitats more accessible to scientific surveys and further new discoveries are likely.

The second author received an aquarium photograph in 2002 from Larry Sharron in Tonga of a *Cirrhilabrus* that appeared to be a close ally of *C. bathyphilus* Randall & Nagareda, 2002. The fish was sold to aquarium fish dealers before the second author recognized it as a probable new species. In 2005 John Randall from the Bishop Museum in Hawaii informed the first author that Bruce Carlson from the Georgia Aquarium (Atlanta, USA) had received several fish from aquarium fish collector Tony Nahacky in Fiji and photographs confirmed it was probably conspecific with the undescribed *Cirrhilabrus* from Tonga. Unfortunately the difficulty in removing this fish from a large public display meant that we were unable to examine it. The first author contacted the collector directly and our efforts to secure specimens were rewarded when Tony Nahacky collected four fish and forwarded them to the first author in December 2005.

Cirrhilabrus bathyphilus was originally described from the Coral Sea (Holmes Reef off north-eastern Australia and Chesterfield Bank near New Caledonia and now reported from Vanuatu) as the 42nd member of the genus (Fig. 1). In the present paper we describe a new species *Cirrhilabrus nahackyi* collected in Fiji and Tonga in the South Pacific as the 48th species of *Cirrhilabrus*.

METHODS

Lengths given for specimens are standard length (SL), the straight-line distance from the median anterior point of the upper lip to the base of the caudal fin (posterior end of the hypural plate). Head length is measured from the median anterior point of the upper lip to the posterior end of the opercular membrane; snout length is from the same anterior point to the fleshy edge of the orbit. Body depth is the greatest depth measured to the base of the dorsal spines and body width is the greatest width just posterior to the opercular flap. Orbit diameter is the greatest fleshy diameter and the interorbital width is the least bony width. Caudal peduncle length is measured horizontally from the rear of the anal fin to the base of the caudal fin and caudal peduncle depth is the least depth. Predorsal, pre-anal and prepelvic lengths are taken from the upper lip to the anterior origin of the respective fin. Lengths of each fin spine, ray and dorsal fin height are taken from the base of each element.

Pectoral ray counts include the short rudimentary upper ray. The lateral line scale counts are given in two parts, the anterior count from the upper end of the opercular flap to below the soft portion of the dorsal fin. The second or posterior lateral line count is from the midlateral peduncular portion to the base of the caudal fin (a single scale usually located posterior to the base of the caudal fin is included). Gill raker counts include rudiments and only a total

Fig. 1. Holotype of *Cirrhilabrus bathyphilus*, AMS I.151103.001 male 48.7 mm SL, Holmes Reef, Coral Sea. Photo by F. Walsh.

count is given as it is difficult to determine which gill raker is at the angle. Type specimens are deposited at the Queensland Museum, Brisbane (QM), United States National Museum, Washington (USNM) and the University of Miyazaki- Fishes Science, Miyazaki (MUFS).

Cirrhilabrus nachakyi, n. sp.

Nahacky's Wrasse (Figs 2-5, Table I)

?*Cirrhilabrus* sp. Nahackyi's Fairy Wrasse - Michael 2009: 115-117.

?*Cirrhilabrus* sp 1. Tongan Fairy Wrasse - Kuiter 2010: 142.

Holotype: QM I.38421, male, 55.6 mm SL, Bega Lagoon, Viti Levu, Fiji Islands, over gentle sloping rubble bottom, 35 m, hand-net, December 2005.
Paratype: QM I.38242, female, 31.8 mm SL, same data as holotype; USNM 387558, male, 42.4 mm SL, same data as holotype; MUFS 23365-23367, male, 52.8 mm SL, same data as holotype; QM I.38241, 65.0 mm SL, Tongatapu, Tonga, from the aquarium trade, June 2007.

Diagnosis: Dorsal rays XI,9; anal rays III,9; pectoral rays 15; lateral line scales 17+5; median predorsal scales 5; horizontal rows of scales on cheek 2; gill rakers 14-15; body depth 3.00-3.45 in SL; body width 2.0-2.2 in body depth; head length 2.7-3.1 in SL; snout length 3.85-4.15 in head length; pelvic fin short, not reaching base of anal fin, 4.3-5.2 in SL; caudal fin rounded; eye large, orbit diameter 3.15-3.85 in head length. Color in life of males: abdomen pale yellow; body red dorsally fading to yellowish ventrally; soft portion of dorsal black outer band, red band mid-dorsally and broader posteriorly, yellow band at base; spinous portion black on the first membrane fading to irregular dusky on yellow toward first soft ray, thin outer margin violet to pale blue; nape dusky. Color in alcohol pale, males with black submarginal band in dorsal fin, caudal fin translucent. Largest specimen 65 mm SL.

Description: Dorsal rays XI,9; anal rays III,9; first dorsal and anal soft rays unbranched, all others branched, last to base; pectoral rays 15, upper two unbranched; pelvic rays I,5; principal caudal rays 13; median 11 unbranched; upper and lower procurrent caudal rays 6, posteriormost segmented; lateral line interrupted; dorso-anterior series of pored scales 17+5, scales above lateral line to base of dorsal fin 2; scales below lateral line to base of anal fin 6; median predorsal scales 5; median prepelvic scales 6; circumpeduncular scales 16; horizontal scale rows on cheek 2; gill rakers14 (14-15); branchiostegal rays 5; vertebrae 9 + 16.

Body depth 3.0 (3.10-3.45) in SL; body com-

pressed, width 2.05 (2.0-2.2) in body depth; head length 2.75 (2.7-3.1) in SL; dorsal profile of head convex; snout moderately pointed its length 4.05 (3.85-4.15) in head length; orbit large 3.7 (3.15-3.85) in head length; interorbital space convex, least bony width 4.15 (3.85-4.35) in head length; caudal peduncle depth 2.3 (2.20-2.45); caudal peduncle length 2.05 (2.05-2.40) in head.

Mouth terminal and oblique, forming angle of approximately 30° to horizontal axis of body and head; mouth small, maxilla extending just posterior to vertical through anterior nostril, upper jaw length 4.4 (4.00-4.35) in head length; dentition typical of the genus, front and upper jaw with three pairs of canine teeth anteriorly at side of upper jaw, anterior pair forward projecting, next two pairs increasing in length, more recurved and laterally projecting; upper with closely set small conical teeth (16 in holotype posterior to third canine); lower jaw with single pair of forward and laterally projecting canines and closely set small conical teeth, first five largest and just posterior of canines (18 in holotype); tongue short and rounded. Gill rakers short, longest on first gill arch and less than one-half of longest gill filaments.

Posterior margin of preopercle with 33 (28-34) small serrae; edge of preopercle free from behind centre of eye to below anterior edge of pupil; lower and rounded margin of preopercle thin and membranous.

Posterior nostril subtriangular with short rim, located just below upper eye level and just forward to front edge of eye; anterior nostril very short membranous tube, slightly higher posteriorly and located anteroventral to posterior nostril, its diameter about equal to sensory pores of cephalic lateralis system. Suborbital pores from middle of eye to below front edge of eye 12 (10-13); pores along free edge of preopercle 8 (7-8); pores on mandible to front of chin 4.

Scales cycloid; head scaled except interorbital space, snout and chin; opercle covered by seven large scales; cheek with two horizontal rows of scales below eye; naked lower flange of preopercle thin, greatest width at angle about 2.5 in orbit diameter in holotype; base of dorsal and anal fins with single row of large elongated scales, one per membrane; last pored scale on lateral line at base of caudal fin enlarged and pointed; terminal scale on midline just posterior to last pored scale greatly enlarged and pointed; no scales on paired fins; pelvic fins with median ventral process of two elongate scales about three-fourths the length of pelvic spine, thin axillary scale of each pelvic fin about three-fourths the length of pelvic spine.

Origin of dorsal fin above third lateral line scale; predorsal distance 3.2 (3.00-3.35) in SL; dorsal fin height elevated in terminal males 1.75 (1.05-2.25) in head length (interspinous membranes of dorsal fin extending above spine tips and supported by slender fleshy rod behind first and second dorsal spines, forming pennant); first dorsal spine 3.2 (2.25-3.65) in head length, about equal to second

Fig. 2. Holotype of *Cirrhilabrus nahackyi* QM I.38421, male, 55.6 mm SL, Bega Lagoon. Fiji. Photo by F. Walsh.

Table I. Proportional measurements of type specimens of *Cirrhilabrus nahackyi* as percentage of standard length.

	Holotype	Paratypes			
	QM I.38421	QM I.38242	USNM 387558	MUFS 23365-67	QM I.38241
Sex	male	female	male	male	male
Standard length (mm)	55.6	31.8	42.4	52.8	65.0
Body depth	33.5	31.8	29.0	32.4	29.8
Body width	16.4	15.4	14.4	14.8	13.8
Head length	36.5	36.8	35.8	34.5	32.5
Snout length	9.0	9.1	9.2	8.3	8.5
Orbit diameter	9.9	11.6	9.9	9.1	8.6
Interorbital width	8.8	8.5	8.7	8.5	8.5
Upper jaw length	8.3	8.5	9.0	8.1	7.5
Caudal peduncle depth	15.8	15.7	14.6	14.6	14.6
Caudal peduncle length	17.8	17.6	15.3	14.4	16.0
Predorsal length	31.1	30.2	33.3	32.4	30.0
Preanal length	58.3	59.7	60.6	58.1	52.3
Prepelvic length	34.5	39.0	40.8	32.8	33.5
Dorsal fin base	63.3	61.6	59.2	58.1	61.7
Height of dorsal fin	20.7	16.4	18.9	21.2	30.6
First dorsal spine	11.3	10.1	10.1	12.9	14.5
Longest dorsal spine	14.4	15.7	15.1	16.7	16.3
Longest dorsal ray	18.5	16.4	18.9	18.2	17.2
Anal fin base	29.1	28.0	28.5	28.8	26.9
First anal spine	8.5	7.9	7.5	8.7	8.0
Second anal spine	9.9	11.6	9.7	10.4	9.5
Third anal spine	11.9	13.2	14.2	11.6	14.0
Longest anal ray	20.1	15.4	16.3	16.7	18.5
Caudal fin length	27.0	26.4	28.1	26.7	24.3
Caudal concavity	0	0	0	0	0
Pectoral fin length	23.9	23.6	24.8	22.7	23.1
Pelvic spine length	12.6	11.0	10.8	12.3	11.1
Pelvic fin length	23.4	21.4	19.6	19.3	20.8

Fig. 3. Paratype of *Cirrhilabrus nahackyi* QM I.38242, female, 31.8 mm SL, Bega Lagoon. Fiji. Photo by F. Walsh.

spine in males; other dorsal spines subequal, the longest 2.55 (2.0-2.4) in head length; first or second soft dorsal ray longest 1.95 (1.90-2.25) in head length; origin of anal fin vertically below last dorsal spine; preanal length 1.7 (1.65-1.90) in SL; first anal spine 4.3 (3.95-4.75) in head; second anal spine 3.7 (3.15-3.70) in head; third anal spine 3.1 (2.3-3.0) in head; sixth, seventh or eighth anal soft rays longest, 1.8 (1.75-2.40) in head; caudal fin 3.7 (3.55-4.10) in SL, caudal fin rounded to slightly rounded on males and slightly rounded on females; third pectoral ray longest 1.55 (1.40-1.55) in head; pelvic fin short extending just beyond anus, longer in males than females; second ray longest 1.55 (1.55-1.85) in head, 4.3 (4.7-5.2) in SL.

Color of male holotype in alcohol: pale yellowish, dusky on nape and extending to below third dorsal spine; dorsal fin mostly dusky grey, first membrane black, soft portion with narrow translucent outer margin and broad outer black band narrowing posteriorly, translucent below and forming narrowing band running anteriorly to base of second dorsal ray; caudal fin translucent with few small dusky spots distally; remaining fins translucent.

Color of the female paratypes in alcohol: pale yellowish, nape dusky to below third dorsal spine; first dorsal fin membrane black; all other fins translucent.

Color of male holotype in life (Figs 2, 4): bright red shading to yellowish red posteriorly, with several indistinct slightly darker red lines following centers of longitudinal scale series punctuated by series of approximately eight irregularly spaced violet spots on each line (stress coloration), six faint violet-red longitudinal lines on head: three above and three either side of eye extending from snout to opercle; chest and lower third of head below eye and posterior to chin abruptly pale yellowish, shading to yellowish red on abdomen; nape dusky and extending to just below third dorsal spine above lateral line; iris red-yellow; spinous portion of dorsal fin yellow, first spinous membrane and pennant black, with broad dusky band centrally and shading to thin dusky yellow band at first soft dorsal ray, base of each spine with dusky triangle; soft portion of fin distinctly differing from spinous, with broad black submarginal band, narrowing slightly posteriorly, broad red central band broadening posteriorly, base of soft portion similar to spinous, yellow with dusky triangle at each dorsal ray base; anal fin yellow with blue-violet margin and broad irregular red submarginal band; caudal fin red shading to translucent distally, faint line of dusky submarginal spots; pelvic fins translucent yellow, first two membranes yellow; pectoral fins transparent, red to yellow at base.

The largest male paratype from Tonga has an overall yellowish body and the four lines on the head are more discernible than in the holotype; and the caudal fin has a submarginal black line, thickest dorsally with a blue-violet margin.

Color of female paratype in life (Fig. 3): bright red body and head, shading to yellow on

Fig. 4. Paratype of *Cirrhilabrus nahackyi* QM I.38241, male, 65.0 mm SL, from Tongatapu. Tonga. Photo by H. Tanaka.

abdomen and below eye, six violet lines with red margin following centers of longitudinal scale series with irregular larger violet spots, uppermost line extending from snout along mid-dorsal line and dorsal fin base, other five lines extending from snout to base of caudal fin, lower three lines on either side of eye, lowest just below the horizontal mid-line; dorsal fin translucent yellow except for black first dorsal spine; anal and caudal fins translucent yellow; paired fins transparent.

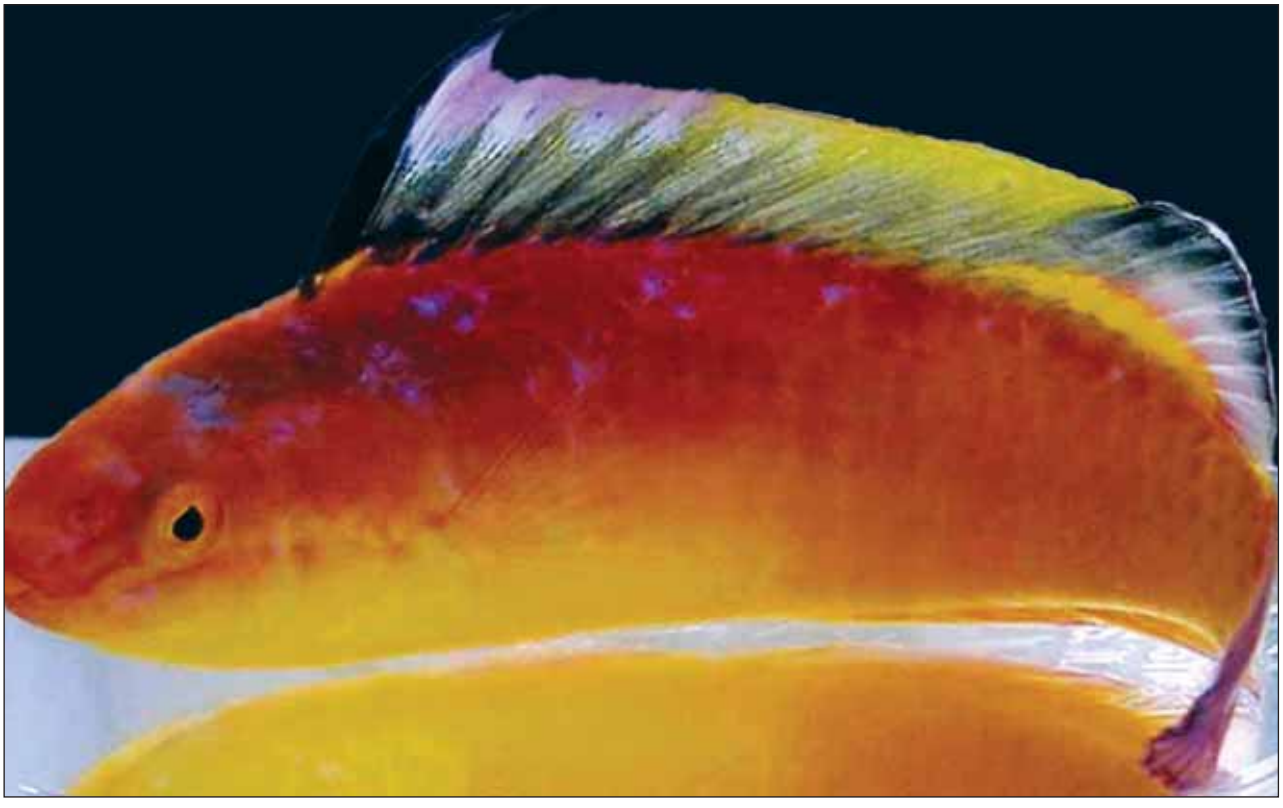

Fig. 5. *Cirrhilabrus nahackyi*, terminal male, 10cm TL, collected in 48 m from Tonga. Photo by L. Sharron.

Fig. 6. *Cirrhilabrus* cf. *bathyphilus,* QM I.38235 male, 69.4 mm SL, Efate Island Vanuatu. Photo by F. Walsh.

REMARKS

The new species is known only from Fiji and Tonga. It appears to be closely related to *Cirrhilabrus bathyphilus*, which occurs in the Coral Sea off Australia, Vanuatu and New Caledonia. Both species share several common morphological features such as general body coloration, size, and also are found in similar rubble habitats on outer reef slopes. The caudal fin shape, general coloration, and color of the dorsal fin are key differences between the two species. Moreover, *C. nahackyi* has a rounded caudal fin in terminal males compared to the emarginate shape of *C. bathyphilus*. The new species also lacks the violet blue spots and thick submarginal black band on the caudal fin that are typical of *C. bathyphilus*. Instead, the caudal fin is pale red with only a thin submarginal black band present in terminal males. The dorsal fin of the new species is dusky yellow on the spinous portion, except for the first membrane, which is black and extended in height, and the soft portion has three distinct bands of yellow at the base, red centrally and a black outer band. In contrast, *C. bathyphilus* has an outer black band running the full length of the fin and a distinctive violet blue band in the middle of the dorsal fin.

It has come to our attention that another fish that is similar to *C. nahackyi* is found at Efate Island in Vanuatu (Fig. 6). Larry Sharron supplied specimens, which have become known as the "Hooded Fairy Wrasse" in the aquarium trade as well as specimens from Tanna Island in southern Vanuatu. The latter fish appears to be *C. bathyphilus* but the Efate Island labrid we believe is a subspecies of *C. bathyphilus* which we plan to describe in a future paper and will illustrate the various colour forms of *C. bathyphilus*.

ACKNOWLEDGEMENTS

We are especially grateful to Tony Nahacky who supplied the four type specimens and provided detailed information on the type location for *Cirrhilabrus nahackyi*. We are also very grateful to Larry Sharron for his initial recognition and information of this new species and for supplying location information for the fifth paratype specimen. We would also like to thank Dr John Randall for assisting greatly with his knowledge and his encouragement, Dr Gerry R. Allen for his help in reviewing our manuscript, Bruce Carlson for some of the first photographs the new species, Jeff Johnson of the Queensland Museum for assistance with the specimens and Sue Morrison of the Western Australian Museum for x-rays.

REFERENCES

ALLEN, G. R. 2000. Description of a new wrasse (Pisces: Labridae: *Cirrhilabrus)* from Northern Sumatra, Indonesia. *aqua, journal of Ichthyology and Aquatic Biology* 4 (2): 45-50.

ALLEN, G. R. & R. H. KUITER. 1999. Descriptions of two new wrasses of the genus *Cirrhilabrus* (Labridae) from Indonesia. *aqua, Journal of Ichthyology and Aquatic Biology* 3 (4): 133-140.

ALLEN, G. R. & J. E. RANDALL. 1996. Three new species of wrasses (Labridae: *Cirrhilabrus)* from Papua New Guinea and the Solomon Islands. *Revue francaise d'Aquariologie* 23 (3-4): 101-111.

ALLEN, G. R., RANDALL, J. E. & CARLSON, B.A. 2003. *Cirrhilabrus marjorie*, a new wrasse (Pisces: Labridae) from Fiji. *aqua, Journal of Ichthyology and Aquatic Biology* 7 (3): 113-118.

BARBER, P. H. & BELLWOOD, D. R. 2005. Biodiversity hotspots: evolutionary origins of biodiversity in wrasses *(Halichoeres:* Labridae) in the Indo-Pacific and new world tropics. *Molecular and Phyogenetics and Evolution* 35 (2005): 235-253.

KUITER, R. H. 2002. *Fairy & rainbow wrasses and their relatives.* 208 pp. TMC Publishing, Chorleywood, UK.

KUITER, R. H. 2010. *Labridae fishes: wrasses.* 142 pp. Aquatic Photographics, Seaford, Australia.

MICHAEL, S. 2009. *Wrasses and parrotfishes. The complete illustrated guide to their identification, behaviors, and captive care.* TFH Publications, Neptune City, New Jersey.

PARENTI, P. & RANDALL, J. E. 2000. An annotated checklist of the species of the labroid fish families Labridae and Scaridae. *J.L.B. Smith Institute of Ichthyology Ichthyological Bulletin* 68: 1-97.

PARENTI, P. & RANDALL, J. E. 2011. Checklist of the species of the families Labridae and Scaridae: an update. *Smithiana* 13: 29-44.

RANDALL, J. E. 1992. A review of the labrid fishes of the genus *Cirrhilabrus* from Japan, Taiwan and the Mariana Islands, with descriptions of two new species. *Micronesica* 25 (1): 99-121.

RANDALL, J. E. & ALLEN, G. R. 2003. *Paracheilinus rubricaudalis*, a New Species of Flasherwrasse (Perciformes: Labridae) from Fiji. *aqua, Journal of Ichthyology and Aquatic Biology* 7 (3): 103-112.

RANDALL, J. E. & NAGAREDA, B. 2002. *Cirrhilabrus bathyphilus*, a new deep-dwelling labrid fish from the Coral Sea. *Cybium* 26 (2): 123-127.

RANDALL, J. E. & PYLE, R. L. 2001. Three new species of labrid fishes of the genus *Cirrhilabrus* from Islands of the Tropical Pacific. *aqua, Journal of Ichthyology and Aquatic Biology* 4 (3): 89-98.

RANDALL, J. E. & KUITER, R. H. 1989. *Cirrhilabrus punctatus*, a new species of labrid fish from the southwestern Pacific. *Revue francaise d'Aquariologie* 16 (2): 43-50.

SENOU, H. & HIRATA, T. 2000. A new labrid fish, *Cirrhilabrus katoi*, from southern Japan. *Ichthyological Research* 4 (1): 89-93.

SPRINGER, V. G. & RANDALL, J. E. 1974. Two new species of the labrid fish from the Red Sea. *Israel Journal of Zoology* 23: 45-54.