

Akihito vanuatu, a new genus and new species of freshwater goby (Sicydiinae) from the South Pacific

by

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ABSTRACT. - Based on characteristics of fin osteology, subfamily Sicydiinae is divided into two tribes. Sicydiini Gill, 1860 is defined as having a broad based pelvic disc, fused to belly between all 5 rays and Sicyopini, new tribe, is defined as having a short based pelvic disc, fused to belly between fifth rays only. *Akihito* n. gen., Sicyopini, is described based on material collected in freshwater streams in the island nation of Vanuatu. *Akihito* n. gen. is differentiated from all other genera in Sicydiinae by a combination of characteristics that include male with only conical and caniniform premaxillary and dentary teeth, female with few caniniform and numerous tricuspid premaxillary teeth and fine horizontal teeth in dentary; tongue free; large broad epural; male with midline scales much greater in height than length; and pelvic disc fused to belly between fifth rays only. *Akihito vanuatu* n. sp. is characterized by dorsal fins VI-I,10, spines 4, 5 and 6 filamentous in male and not in female; anal fin I,10; pectoral fin usually 16 (15-17); scales in lateral series: male 14-18, female 24-32; predorsal scales: male zero, female 0-2; belly: male naked and female with few cycloid scales close to anus; cephalic sensory pores usually A, B, C, D, F, H, N and O, pores K and L and associated posterior oculoscapular canal not usually present, all pores paired except pore D which is singular.

RÉSUMÉ. - *Akihito vanuatu*, un nouveau genre et nouvelle espèce de gobie (Sicydiinae) du Pacifique sud.

La sous-famille des Sicydiinae est divisée en deux tribus fondées sur des caractéristiques ostéologiques des nageoires. La tribu des Sicydiini Gill, 1860 est définie comme ayant un disque pelvien à base large et fusionné à l'abdomen entre chacun des cinq rayons. La tribu des Sicyopini, nouvelle tribu, est définie comme ayant un disque pelvien à base étroite fusionné à l'abdomen entre les cinquièmes rayons uniquement. *Akihito* n. gen., Sicyopini, est décrit sur la base de matériel collecté dans les rivières du Vanuatu. *Akihito* n. gen. se différencie des autres genres de Sicydiinae par la combinaison des caractéristiques suivantes : mâle avec seulement des dents prémaxillaires et dentaires coniques et caniniformes ; femelle avec quelques dents prémaxillaires caniniformes et de nombreuses dents tricuspides, ainsi que de fines dents horizontales sur le dentaire ; langue libre ; épural grand et large ; mâle avec des écailles latérales plus hautes que larges ; disque pelvien à base étroite, fusionné à l'abdomen entre les cinquièmes rayons uniquement. *Akihito vanuatu* n. sp. est caractérisé par : des nageoires dorsales VI-I,10, épines 4, 5 et 6 filamenteuses chez le mâle et non chez la femelle ; une nageoire anale I,10 ; des pectorales généralement 16 (15-17) ; des écailles en ligne latérale (mâle 14-18, femelle 24-32) ; des écailles prédorsales (mâle zéro, femelle 0-2) ; un abdomen nu chez le mâle et avec quelques écailles cycloïdes près de l'anus chez la femelle ; des pores céphaliques généralement A, B, C, D, F, H, N et O, les pores K et L ainsi que le canal oculoscapulaire postérieur associé n'étant pas toujours présents ; tous les pores sont doubles à l'exception du pore D qui est simple.

Key words. - Gobioidae - Sicydiinae - *Akihito vanuatu* - PSE - Vanuatu - New genus - New species - Freshwater.

Estimates concerning the number of species belonging to Gobioidae have varied considerably over the past 30 or so years with numbers ranging from as few as 500 (Burton and Burton, 1975) to as many as 7,000 (Thresher, 1980). Most recent estimates place the number of species at about 2000 (Akihito *et al.*, 2000; Allen, 1991; Hoese, 1996; Larson, 2001; Wang *et al.*, 2001; Winterbottom, 1993), but whether this figure actually has much validity remains to be ascertained, especially in view of the number of new species described over the past two decades alone.

Eschmeyer (1990) lists 557 named genera (extant) as belonging to Gobioidae but this figure does not reflect synonymy or if a name is used only as a subgenus, however this

information can be determined by reading the account for each genus. It has been more than a decade since the publication of this work (Eschmeyer, 1990) and during that span of time new genera and subgenera have been described, others placed into synonymy and Schindleriidae Berg, 1940 has been brought into Gobioidae (Johnson and Brothers, 1993). Before the numbers of genera and species belonging to Gobioidae can be accurately assessed much more serious systematic taxonomic research must be accomplished that includes a thorough investigation into the fossil record that will better document suspected relationships as opposed to determinations based on hypotheses and opinion.

The primary purpose of the present research is to

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describe the freshwater goby *Akihito vanuatu*, new genus and new species, discovered in the island nation of Vanuatu located on the southwestern edge of the Pacific Plate (sensu Springer, 1982) between New Caledonia and the Solomon Islands. Secondly this study divides the subfamily Sicydiinae Gill, 1860 into two tribes by refining the definition of pelvic fin osteology as earlier defined (*sensu stricto* Parenti and Maciolek, 1993) and implementing that provided in Sakai and Nakamura (1979).

METHODS

Methods follow Watson (1995, 1999). Counts and measurements were taken from the right side using a dial caliper, expressed to the nearest tenth of a millimeter and then that value rounded to the nearest whole percent of standard length (SL) by which all values are compared and used in tables and any discussion.

Although the Zoological Commission recommends using 'Valenciennes, *in*: Cuvier and Valenciennes, 1837,' when referencing this work the citation appear in this research as either Valenciennes, 1837 with specific reference to the authorship of taxa and as Valenciennes (1837) pertaining to all other reference of the work. The recommended citation is lengthy and in the interest of conserving at least some space, Valenciennes (1837) is used here; furthermore, it has been used previously in works by the first author and the full and recommended citation is reflected in the reference section.

The International Code of Zoological Nomenclature (1999) with an authorship of International Commission on Zoological Nomenclature is abbreviated as ICZN. Abbreviations used to represent institutions and collections cited follow Leviton *et al.* (1985) except BLIH (Biological Laboratory, Imperial Household, Akasaka Imperial Palace, Tokyo) formerly LICPP. Abbreviations used to represent cephalic sensory pores follow Akihito (1986) additionally pore R follows Shibukawa and Iwata (1998), all letters representing sensory pores are capitalized using a modified Latin alphabet including the letters J, K, W and Y (ICZN 11.2). Following Watson *et al.* (2002) those Sicydiinae having only two preopercular pores are referred to N and O and not M and O as reflected in research prior to it. Because Latin is the language of zoology (Steyskal, 1970) the latinized system utilized in Akihito (1986) is preferred to the Greek system first proposed in Sanzo (1911) and later adapted and modified in some contemporary works especially with regard to European and eastern Atlantic gobies and to other more complex systems that have been proposed and used (Takagi, 1957; Lachner and McKinney, 1974).

Teeth are always counted to right of symphysis. Upper jaw teeth are referred to here as "premaxillary teeth." Teeth

projecting horizontally from dentary are termed here as "horizontal teeth" following Valenciennes (1837) in the account of 'Des Boléophthalmes,' "... celles de la mâchoire inférieure étant très-fines et disposées horizontalement." Dentary teeth with a more normal or conventional appearance are referred to here as symphyseal teeth.

Derivation of dorsal pterygiophore formula follows Birdsong (*in* Lachner and McKinney, 1974), later expanded in Birdsong (1975) and Birdsong *et al.* (1988). Abbreviations and terminology used to identify osteology follow Birdsong (1975).

Scanning electron microscopy was accomplished on a Zeiss DSM950 digital scanning microscope located at the University Regensburg in the German state of Bavaria. Art and photography is by the first author (REW) unless otherwise stated.

AKIHITO NEW GENUS

Akihito new genus (type species: *Akihito vanuatu* new species) (Figs 1-3)

Etymology

The new genus name is *Akihito*. The first latinized appearance of *Akihito* is *Platygiobopsis akihito* Springer & Randall, 1992. The new genus name honors Emperor Akihito for his many contributions to goby systematics and phylogenetic research and is defined here as a masculine noun.

Description

Exposed premaxillary teeth in a single row, slightly flexible and distinctly tricuspid in females appearing in replacement bands from a fleshy sack above premaxilla and conveyed ventrally over outer surface of premaxilla beneath surface of gum and replaced in single rows along ventral edge of premaxilla (Fig. 1A, B) and termed extraosseous development (Trapani, 2001). Female have also few canine like tooth at the posterior tip of the premaxilla. As males approach sexual maturity tricuspid teeth replaced with fixed recurved conical to canine-like teeth by granular budding along ventral edge of premaxilla beginning with posterior-most tooth until adult males possess only fixed conical to canine-like teeth (Fig. 1C-E) and termed intraosseous development (Trapani, 2001). Dentary with a single row of recurved conical to canine-like symphyseal teeth in both sexes, a single row of recurved canine-like horizontal teeth projects anteriorly from each dentary in male (Fig. 2) and fine horizontal teeth in female. Tongue small, rounded and mostly free from floor of mouth anteriorly.

Pelvic disc adherent to belly between fifth rays only. Pectoral base appears at approximately 15° with relationship to body axis.

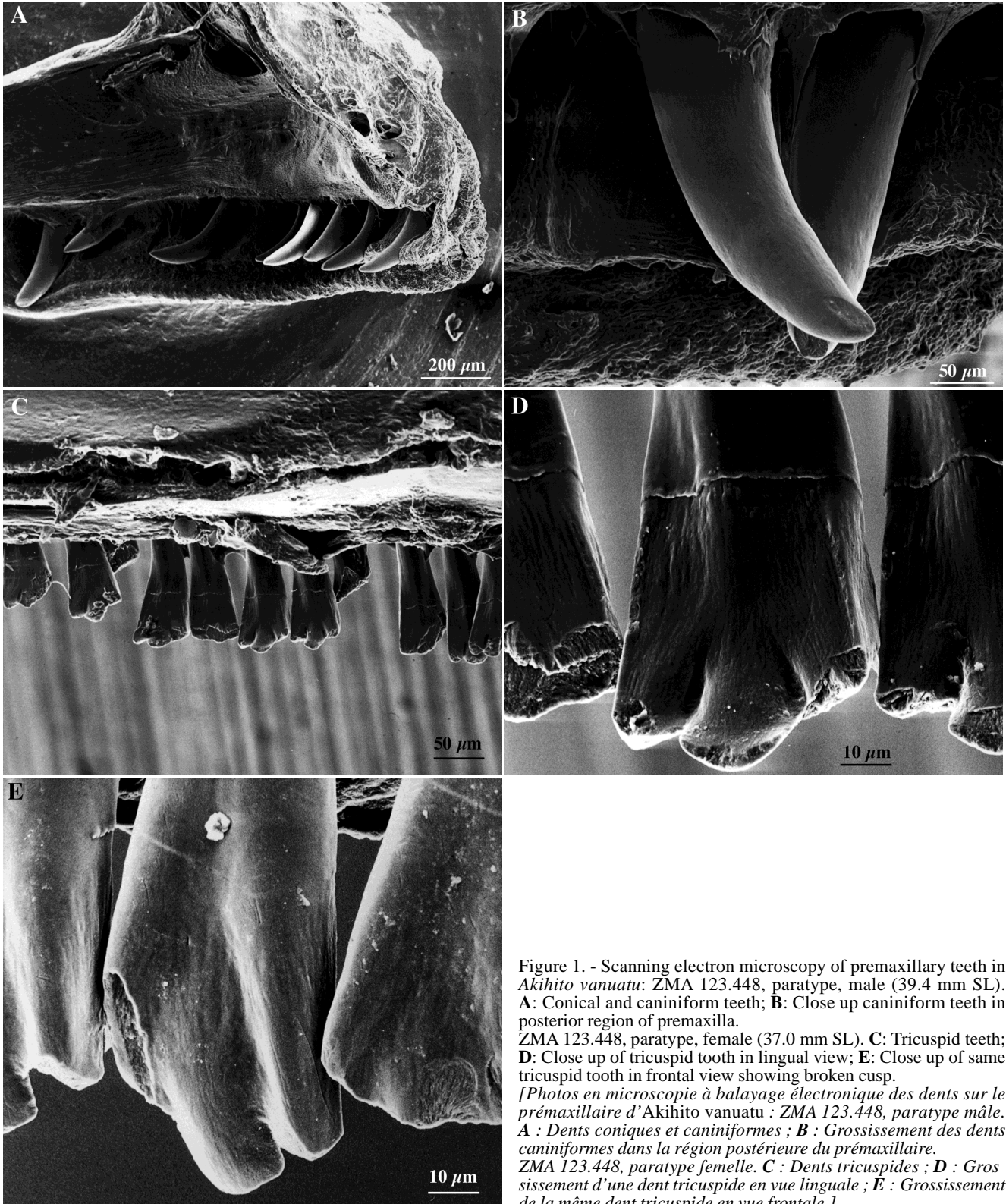


Figure 1. - Scanning electron microscopy of premaxillary teeth in *Akihito vanuatu*: ZMA 123.448, paratype, male (39.4 mm SL). **A**: Conical and caniniform teeth; **B**: Close up caniniform teeth in posterior region of premaxilla. ZMA 123.448, paratype, female (37.0 mm SL). **C**: Tricuspid teeth; **D**: Close up of tricuspid tooth in lingual view; **E**: Close up of same tricuspid tooth in frontal view showing broken cusp. [Photos en microscopie à balayage électronique des dents sur le prémaxillaire d'*Akihito vanuatu* : ZMA 123.448, paratype mâle. **A** : Dents coniques et caniniformes ; **B** : Grossissement des dents caniniformes dans la région postérieure du prémaxillaire. ZMA 123.448, paratype femelle. **C** : Dents tricuspides ; **D** : Gros - sissement d'une dent tricuspide en vue linguale ; **E** : Grossissement de la même dent tricuspide en vue frontale.]

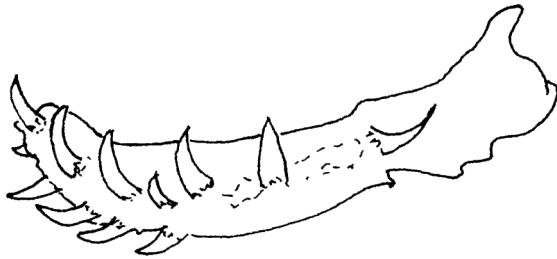


Figure 2. - Diagrammatic illustration of dentary in dorsal view in male (ZMA 123.448, paratype 39.4 mm SL) showing conical and caniniform symphyseal and horizontal teeth. [Illustration du dentaire en vue dorsale chez le mâle montrant les dents symphyséales coniques et caniniformes et les dents horizontales.]

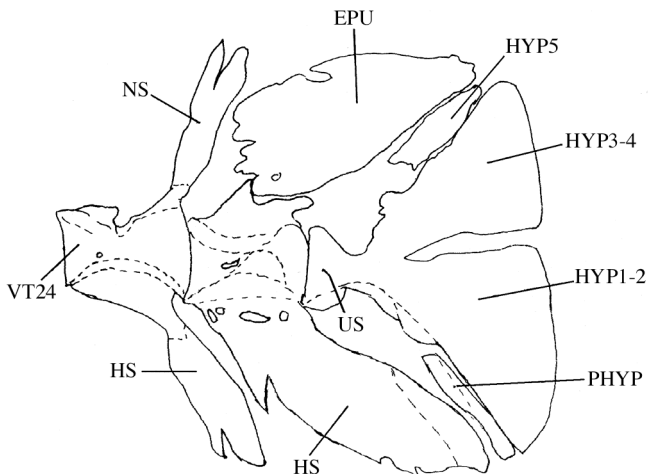


Figure 3. - Skeleton of the urophore complex in *Akihito vanuatu* (ZMA 123.448, paratype, male, 39.4 mm SL): VT24 = vertebra 24; NS = neural spine; HS = haemal spine; US = urostyle; EPU = epural; HYP5 = hypural 5; HYP3-4 = hypural 3-4; HYP1-2 = hypural 1-2; PHYP = parhypural. [Squelette du complexe urophore d'*Akihito vanuatu* : VT24 = vertèbre 24; NS = épine neurale; HS = épine hémale; US = urostyle; EPU = épural; HYP5 = hypural 5; HYP3-4 = hypural 3-4; HYP1-2 = hypural 1-2; PHYP = parhypural.]

Most scales cycloid, few ctenoid scales may be present along midline of caudal peduncle and between second dorsal and anal fins, midlateral scales between second dorsal and anal fins much higher than long being especially pronounced in males.

Osteology. - Vertebral count 10 + 16 = 26; dorsal pterygiophore 3(12210); 2 haemal spines anterior to first anal pterygiophore; caudal fin with 1 broad epural (Fig. 3); and pectoral fin with 4 radials.

Distribution

Akihito is currently known from Vanuatu, Futuna and Fiji (species from Futuna and Fiji to be described separately).

Affinities

The monophyletic characteristic of pelvic fin osteology defining Sicydiinae (*sensu stricto* Parenti and Maciolek,

1993), that is also autapomorphic further refinement, can be used to separate the subfamily into two tribes.

Sicydiini Gill, 1860 is defined as having a broad based pelvic disc (*sensu stricto* Sakai and Nakamura, 1979), pelvic fin adherent to belly between all five rays and includes five genera (*Cotylopus* Guichenot, 1863; *Lentipes* Günther, 1861; *Sicydium* Valenciennes, 1837; *Sicyopterus* Gill, 1860; new genus 1 (West Africa)). Sicyopini, new tribe (type genus: *Sicyopus* Gill, 1863) is defined as having a narrow based pelvic disc (*sensu stricto* Sakai and Nakamura, 1979), pelvic fin adherent to belly between fifth rays only and includes three genera (*Akihito*; *Sicyopus*; *Stiphodon* Weber, 1895).

Akihito appears closest to *Sicyopus* in that these are the only two genera in Sicydiinae having the tongue free, in all other genera this is fused to the floor of the mouth. *Akihito* shares with *Cotylopus*, *Lentipes*, *Stiphodon* and new genus 1 the dorsal tip of ascending process on premaxilla narrower than the process below, in *Sicydium* and *Sicyopterus* the ascending process is broader at the dorsal tip than below. *Akihito* also differs from *Stiphodon* having two haemal spines prior to the first anal pterygiophore, *Stiphodon* usually with three (Birdsong *et al.*, 1988). *Akihito* differs from *Sicyopus* in the dentition in females and in lateral scales.

AKIHITO VANUATU NEW SPECIES

(Figs 4-6; Tabs I-III)

Material examined

Twenty three specimens from Vanuatu, totaling 14 males and 9 females, size range 22.3-43.2 mm SL, largest male 43.2, largest female 39.3, smallest gravid female 29.4.

Holotype. - MNHN 2006-771, male (39.9 mm SL); Vanuatu: Penama Province: Ambae: stream near Pauls Conservation, 26 Oct. 1998, Vanuatu Department of Conservation coll.

Paratypes. - MNHN 2006-774, 1 male, 1 female (37.8-39.2 mm SL), Vanuatu: Penama Province, Ambae, stream near Pauls Conservation, 19 Jul. 2002, Keith and Vigneux coll. - MNHN 2006-773, 4 males, 3 females (26-43.2), Vanuatu: Penama Province, Ambae, stream near Pauls Conservation, 19 Jul. 2002, Keith and Vigneux coll. - MNHN 2006-772, 3 males, 1 female (31.9-43), Vanuatu: Penama Province, Ambae, stream near Pauls Conservation, 26 Oct. 1998, Vanuatu Department of Conservation coll. - BLIH 1998020, 2 males, 2 females (29.4-39.3) and ZMA 123.448, 2 males, 2 females (35.6-41.0) (2 cleared and counter-stained), Vanuatu: Penama Province, Ambae, stream near Pauls Conservation, 26 Oct. 1998, Vanuatu Department of Conservation coll. - ZMA 123.447, male (22.3), Vanuatu: Penama Province, Ambae, Wiasine Stream, 20 Oct. 1998, Vanuatu Department of Conservation coll.

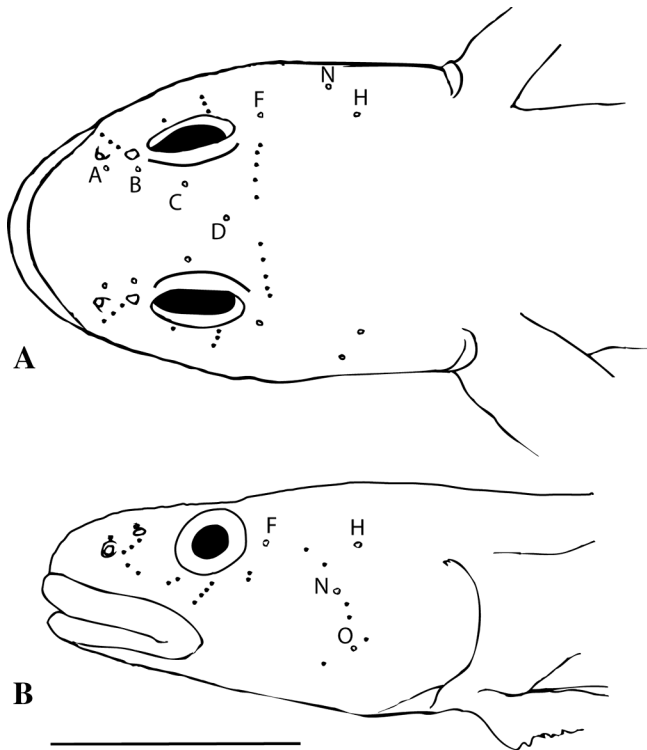


Figure 4. - Diagrammatic illustration of the head of *Akihito vanuatu* showing head pores and sensory papillae. **A**: Dorsal view; **B**: Lateral view. Scale bars = 5 mm. [Illustration de la tête d'*Akihito vanuatu* montrant les pores céphaliques et les papilles sensorielles. **A** : Vue dorsale; **B** : Vue latérale. Echelle = 5 mm.]

Diagnosis

Female with closely set slightly flexible tricuspid premaxillary teeth and 0-1 canine like tooth at the posterior tip of the premaxilla, immature male with conical teeth posterior to tricuspid teeth, adult males with only fixed recurved conical to canine-like teeth. Scales along lateral midline between second dorsal and anal fins much higher than long, males with few ctenoid scales midlaterally and females with only cycloid scales, females with more and generally smaller scales than males.

Description

Dorsal fins VI-I,10, first dorsal fin membrane may connect basally to second dorsal fin in male and not in female; in male first dorsal spines 4, 5 and 6 filamentous with spine 5

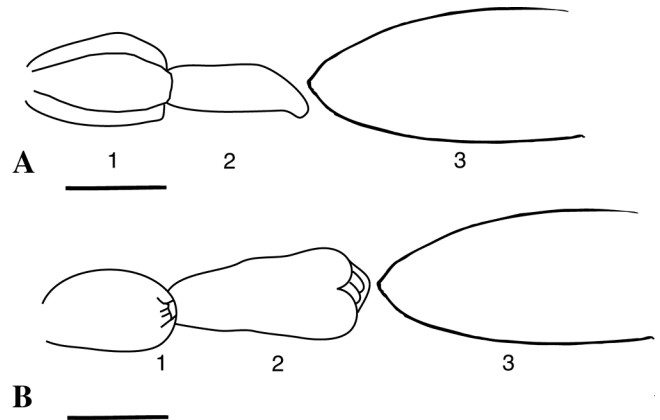


Figure 5. - Diagrammatic illustration of the urogenital papilla of *Akihito vanuatu* (ventral view). **A**: Male; **B**: Female; 1: anus; 2: urogenital papilla; 3: anal fin. Scale bars = 1 mm. [Illustration des papilles urogénitales d'*Akihito vanuatu* (vue ventrale). **A** : Mâle ; **B** : Femelle ; 1 : anus ; 2 : papille urogénitale ; 3 : nageoire anale. Echelle = 1 mm.]

longest, spines not filamentous in female. Anal fin I,10 and directly opposite to second dorsal fin. Pectoral fin usually 16 (15-17), ventral most ray simple (1-3), uppermost rays extend slightly beyond membrane not appearing feathery or silky. Caudal fin usually 13 (12-14), posterior margin rounded. Pelvic disc with 1 stout spine and 5 heavily branched rays, fifth rays joined together, their entire length forming a strong circular disc; a strong frenum between both spines, disc strongly adherent to belly between fifth rays only.

Scales in lateral series mostly cycloid, few ctenoid scales may be present along midline on caudal peduncle in male; distribution of scales sexually dimorphic in number, male (14-18) with midline scales much greater in height than length appearing broadly elliptical, forward advance of scales along midline ventral to first dorsal fin origin; female (24-32) with well developed scales extending anterior to posterior region of nape. Scales in transverse back series: male usually 0 (0-2), female 9-14. Scales in transverse forward series: male usually 0 (0-1), female usually 8 (8-9). Scales in predorsal series: male without, female with 0, 1 or 2 large cycloid scales. Scales in zigzag series with usually 7-9 in males, 9 in females. Head, breast and pectoral base without scales. Belly may be with few cycloid scales close to anus in female and naked in male.

Table I. - Teeth in *Akihito vanuatu*. [Dents chez *Akihito vanuatu*.]

		Premaxillary teeth																					
		7	8	9	10	11	12	13	14	15	16	17	-	-	30	31	32	33	34	35	36	37	
Males		5	3	2	2	1	-	-	-	-	-	1			-	-	-	-	-	-	-	-	
Females		-	-	-	-	-	-	-	-	-	-	-			1	1	1	1	2	1	1	1	
		Symphyseal teeth																					
		3	4	5	6	7																	
Males		2	1	7	4	-																	
Females		1	2	4	1	1																	

Table II. - Scale counts in *Akihito vanuatu*. [*Méristique chez Akihito vanuatu.*]

		Lateral scales																Predorsal scales					
		14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	0	1	2
Males		1	5	4	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-
Females		-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	4	-	2	1	4	3	2
		Transverse back scales																					
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14							
Males		9	2	3	-	-	-	-	-	-	-	-	-	-	-	-							
Females		-	-	-	-	-	-	-	-	1	2	3	1	1	1								
		Transverse forward series							Zigzag scales														
		0	1	2	3	4	5	6	7	8	9	6	7	8	9	10							
Males		9	5	-	-	-	-	-	-	-	-	1	4	5	4	-							
Females		-	-	-	-	-	-	-	7	2	-	-	1	7	1								

Table III. - Morphometrics in *Akihito vanuatu* expressed to the nearest whole percent of standard length. [*Caractères morphométriques chez Akihito vanuatu exprimés en pourcentage de la longueur standard et arrondis au nombre entier le plus proche.*]

		Predorsal length					Preanal length					Head length					Jaw length									
		33	34	35	36	37	38	56	57	58	59	60	61	62	63	21	22	23	24	25	26	8	9	10	11	12
Males		1	2	4	3	3	1	3	2	2	5	1	1	-	-	2	1	3	3	4	1	-	-	2	5	5
Females		-	2	1	2	3	1	-	-	-	-	2	3	3	1	2	1	3	3	-	-	3	5	3	-	-
		Caudal peduncle length				Body depth in males at origin of second dorsal fin									Caudal peduncle depth											
		16	17	18	19	20	10	11	12	13	14					10	11	12	13							
Males		5	3	2	2	2	1	2	3	4	3	Males+females				4	8	6	4							
Females		2	1	2	3	1	-	-	-	-	-															
		Second dorsal fin length																								
		27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49		
Males		-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	3	3	3	1	-	2		
Females		1	-	1	1	2	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-		
		Anal fin length										Caudal fin length														
		24	25	26	27	28	29	30	31	32	33	34	35	36	37	17	18	19	20	21	22	23	24	25		
Males		-	-	-	-	-	-	-	-	2	-	2	6	2	1	1	-	-	-	-	1	3	4	4		
Females		1	-	-	1	1	1	1	2	1	1	-	-	-	-	1	-	-	3	2	2	-	-	-		

Premaxillary teeth: see above. Symphyseal teeth usually 5 (3-7) appear conical to canine-like, most recurved in a broad curving band not meeting at symphysis, horizontal teeth recurved conical to canine-like and restricted to anterior region on both dentaries in male and as fine numerous teeth in female. Upper lip smooth without any clefts. Lower lip incomplete in area horizontal teeth project outwards.

Gill rakers on inner edge of outer gill arch 1-2+1+2, each raker appears as small papillous projections without ossification. Cephalic sensory pore system usually A, B, C, D, F, H, N and O, pores K and L present in further specimens along with associated posterior oculoscapular canal separated from pore K, pore D singular with all other pores paired. Cutaneous sensory papillae well developed with each being circular in appearance set in a shallow depression (Fig. 4).

Sexual dimorphism well developed. Besides teeth, male with length of jaw and unpaired fins greater than in female and first dorsal spines filamentous in male and not in female.

Anterior to urogenital papilla in male with an expanded fleshy sack extending slightly under urogenital papilla, not well developed in female. Adult male with midlateral scales much larger than those found on female. Male with slender urogenital papilla pointed at distal tip and in female blunt with two fimbriate projections (Fig. 5).

Colour in preservation

Both sexes similarly coloured. Male: Background of body and head tan, belly cream colored; most of body with fin black pigmentation giving a slightly dusky appearance with head, especially snout, opercle and branchiostegal membrane dusky. Scales anteriorly with a dusky margin, scales on caudal peduncle become darker with most scale surface dusky. Dorsal fins with spines, rays and membrane uniformly dusky or with 4 to 7 small black dots. Caudal fin with dusky rays darkest medially and membrane generally clear or slightly pigmented. Anal fin slightly dusky especial-



Figure 6. - *Akihito vanuatu*. **A**: Male, paratype: MNHN 2006-774 (Picture E. Vigneux); **B**: Female, paratype: MNHN 2006-774, (Picture E. Vigneux).

ly close to base with remainder generally without pigmentation. Pelvic disc slightly dusky in center and medially on rays 4 and 5. Pectoral fin with rays their entire length dusky and membrane generally clear, pectoral fin base dusky. Female: Coloration almost identical to male. Anterior to first dorsal fin, nape with a dusky band. Head ventrally slightly dusky including branchiostegal rays. First dorsal fin with blackish spot on each spine about 1/3 distance from base; second dorsal fin with blackish bars and blotches adjacent to anterior edge of each rays. Caudal fin with rays dusky and membrane clear. Anal fin rays slightly dusky, membrane slightly dusky close to base. Pectoral fin rays slightly dusky with membrane generally clear except basally; pectoral fin base slightly dusky with a blackish spot medially. A dusky blotch present at base of caudal fin.

Colour in life

Males (Fig. 6A): Area between second dorsal and anal fins and caudal peduncle yellowish, extending onto second dorsal and anal fins and basally on caudal fin. Each scale with a posterior black margin. Area between first dorsal fin and pectoral base reddish. Dorsally body and head may be with yellow or greyish iridescence. Head greyish to blackish. First dorsal fin with blackish spots on each spine and numerous tiny spots on membrane. Second dorsal fin with

blackish bars on rays and blotches adjacent to anterior edge of each rays. Caudal fin with rays dusky and membrane clear. Anal fin rays and membrane dusky. Pectoral fin rays and membrane dusky.

Female (Fig. 6B): Area between first dorsal, anal and caudal peduncle yellowish extending onto first dorsal and anal fins and basally on caudal fin. Belly greyish. Each scale with a posterior black margin. Predorsal and head area greyish and whitish. Dorsally body and head may be with yellow or greyish iridescence. A midlateral blackish band is present on the second half of the body. First dorsal fin with few blackish spot on membrane. Second dorsal fin with blackish bars on rays and few blotches adjacent to anterior edge of each rays. Caudal fin with rays dusky and membrane clear. Anal fin rays and membrane dusky. Pectoral fin rays slightly dusky with membrane generally clear except basally; pectoral fin base slightly dusky with a blackish spot medially.

Ecology

Akihito vanuatu is found in swift clear streams with rocky bottom. The stream near “Pauls conservation” in Ambae island is not perennial. In July 2002, when a part of the specimen were caught, there was no running water in the river and the species was found in small or large pools grooved in the main rock. This absence of running water

during a part of the year involve a real adaptation of the species life cycle. Indeed, all larvae of Sicydiins need to go to the sea to complete their development and then, after few weeks spent in the sea, they need to recolonize rivers for growth and reproduction (Keith, 2003). In this particular case of no perennial stream, the new species needs to use heavy rains to migrate to the sea or to the river. The site where the mature specimens were found is situated at an altitude of 300 m. Feeding habits have not been studied in depth but the few specimens examined seemed to feed on aquatic insects and crustacean.

Distribution

Akihito vanuatu is currently known only from the island nation of Vanuatu.

Etymology

The new species is named for the island nation of Vanuatu and is defined as a noun in apposition.

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