**2a.** Pectoral filaments 8 (rarely 9); gillrakers 34 to 38 (mode 36) (Fig. 84, Plate IIIh) . . . . . ***Polydactylus octonemus***
(New York to Yucatán, western Atlantic)

**2b.** Pectoral filaments 7 (rarely 8); gillrakers 22 to 30 (mode 27 or 28) . . . . . → ***3***

**3a.** Pored lateral-line scales 67 to 73 (mode 70); anal-fin soft rays 13 to 15 (mode 14) (Fig. 85, Plate IVa) . ***Polydactylus oligodon***
(Florida to Brazil, western Atlantic)

**3b.** Pored lateral-line scales 54 to 63 (mode 58); anal-fin soft rays 11 to 14 (mode 13) (Fig. 86, Plate Vh) . ***Polydactylus virginicus***
(New Jersey to Brazil, western Atlantic)

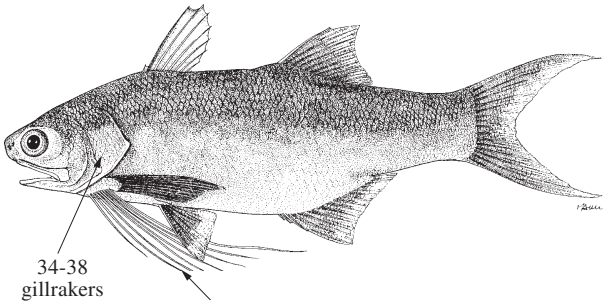


**Fig. 84** ***Polydactylus octonemus***

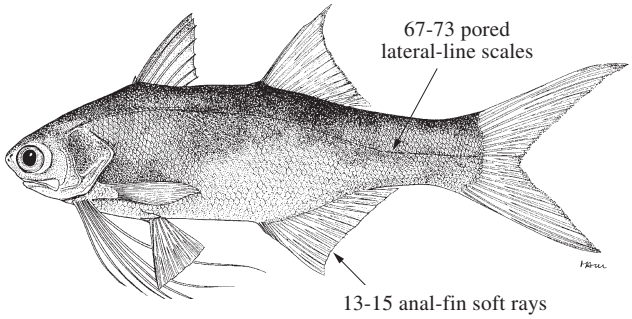


**Fig. 85** ***Polydactylus oligodon***

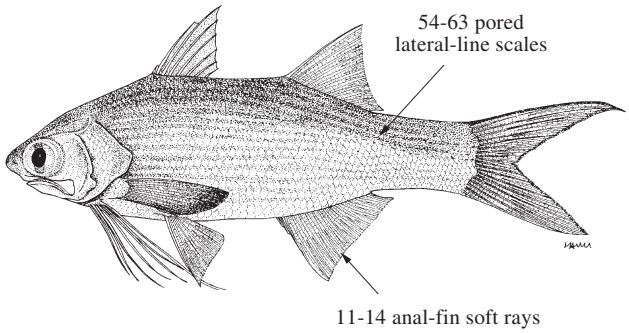


**Fig. 86** ***Polydactylus virginicus***

## *Polydactylus approximans* (Lay and Bennett, 1839)

**Fig. 87; Plate IIf**

***Polynemus approximans*** Lay and Bennett, 1839: 57 [type locality: San Blas and Mazatlán, Mexico, based on a brief sketch and description by Mr Collie; type material apparently lost, see Motomura, Kimura and Iwatsuki, 2002].

**Synonyms:** ***Polynemus californiensis*** Thominot, 1886: 161 [type locality: California, USA; holotype (MNHN 1884-487, 179 mm standard length)].

**FAO Names: En** - Blue bobo; **Fr** - Barbure bleu; **Sp** - Barbudo azul.

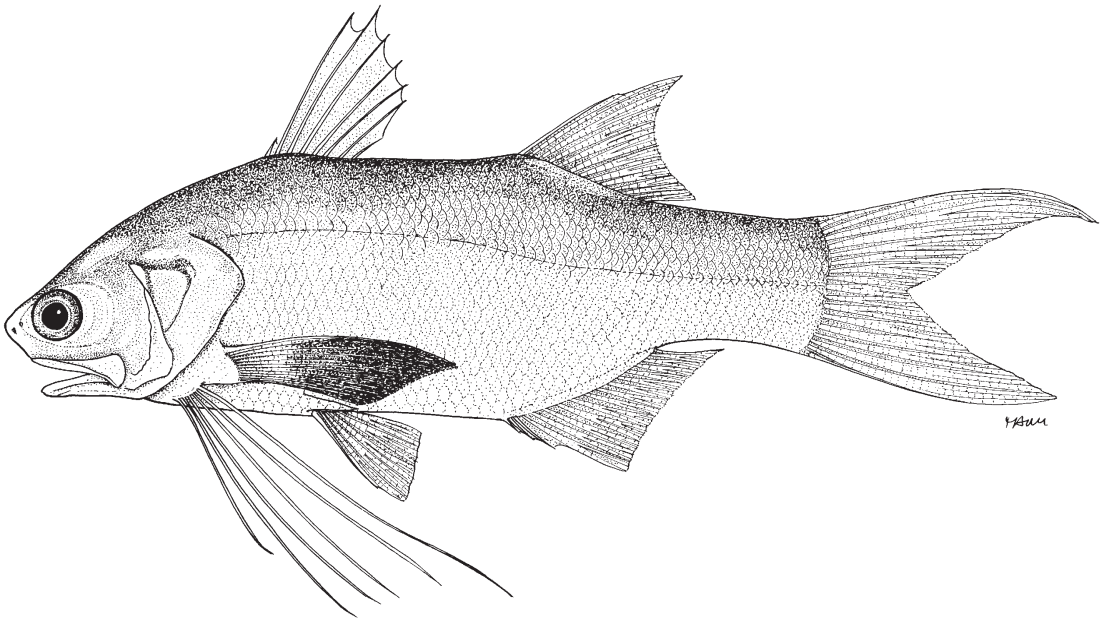

**Fig. 87** ***Polydactylus approximans***

**Diagnostic Features:** A medium-sized species. Body depth at first dorsal-fin origin 25 to 32% (mean 30%) of standard length; head length 28 to 35% (mean 31%) of standard length. Snout pointed; occipital profile nearly straight in young, becoming somewhat concave with growth. Posterior margin of maxilla not reaching to or extending slightly beyond level of posterior margin of adipose eyelid; maxilla not covered with scales; upper-jaw length 13 to 15% (mean 14%) of standard length; depth of posterior margin of maxilla less than eye diameter; lip on lower jaw well developed, dentary teeth restricted to dorsal surface; teeth villiform in broad bands on vomer, palatines and ectopterygoids; shape of vomerine tooth plate crescentic or elliptic. Posterior margin of preopercle serrated. First dorsal fin with VIII spines, thickness of all first dorsal-fin spine bases similar; second dorsal fin with I spine and 11 to 13 (mode 12) soft rays; anal fin with III spines and 13 to 15 (mode 14) soft rays, anal-fin base greater than second dorsal-fin base; pectoral fin with 14 to 16 (mode 15) rays (all rays unbranched), its length 24 to 32% (mean 28%) of standard length, posterior tip not reaching to or extending beyond level of posterior tip of pelvic fin; pectoral filaments 6 (rarely 5 or asymmetrically 6 and 7), first filament shortest, just reaching to or extending slightly beyond level of pelvic-fin origin; second to fourth pectoral filaments extending beyond level of pelvic-fin origin; length of fifth pectoral filament variable, from not reaching level with posterior margin of pelvic fin to just reaching level with anal-fin origin; sixth pectoral filament longest, its length 35 to 48% (mean 41%) of standard length, just short of level of anal-fin origin or reaching to near midpoint of anal-fin base; caudal fin deeply forked, upper and lower caudal-fin lobes not filamentous, upper caudal-fin lobe 37 to 43% (mean 40%) and lower lobe 35 to 40% (mean 37%) of standard length. Pored lateral-line scales 56 to 63 (mode 60); lateral line bifurcated on caudal-fin membranes, extending to posterior margins of upper and lower caudal-fin lobes; scale rows above lateral line 7 or 8 (mode 7), below 11 to 13 (mode 12). Gillrakers 11 to 14 (mode 13) on upper limb, 15 to 18 (mode 17) on lower limb, 26 to 31 (mode 30) total. Vertebrae 10 precaudal and 14 caudal; supraneural bones 3. Swimbladder present, small. **Colour:** Head and body grey dorsally, silver ventrally; anterior margins of first and second dorsal fins black, remaining parts dusky; pectoral fin dusky; base of pectoral filaments white, becoming blackish on posterior tips; base and posterior margin of pelvic fin white, remaining parts dusky; posterior margin of anal fin white, remaining parts dusky; margins of caudal fin black, remaining parts dusky.

**Geographical Distribution:** Currently known from the eastern Pacific Ocean, where it ranges from Monterey Bay, California, USA to Callao, Peru (Fig. 88), being relatively common in the Central American region in latitudes between 5° and 20°N. Grove and Lavenberg (1997) reported a single small example (LACM W53-178) collected from the Galápagos Islands, and is considered to occur rarely around the islands. Although Pequeño (1989) listed ***P. approximans*** and ***P. opercularis*** from Chile, such records remain unsubstantiated.

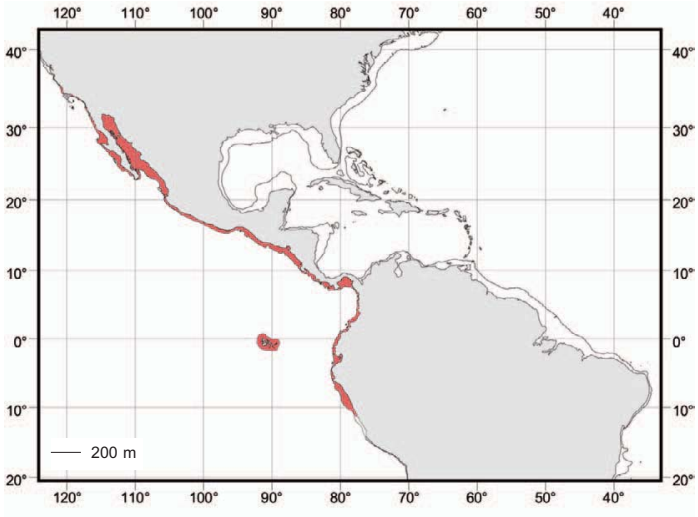


**Fig. 88** ***Polydactylus approximans***
Known distribution

**Habitat and Biology:** Although ***P. approximans*** generally inhabits muddy or sandy bottoms in coastal waters and estuaries, larvae and juveniles (less than about 40 mm standard length) sometimes occur at the water surface several hundred kilometres offshore (Grove and Lavenberg, 1997). Most of the collection data available indicated the specimens as having been taken from depths less than 30 m. According to Grove and Lavenberg (1997), the species is omnivorous, feeding on worms, sand crabs, shrimp, clams, and sometimes fish like small anchovy.

**Size:** Maximum total length at least 35 cm (Allen and Robertson, 1994).

**Interest to Fisheries:** Esteemed as a food fish throughout the tropical eastern Pacific.

**Local Names:** COLOMBIA: Barbeta; EQUADOR: Aguapuro; MEXICO: Barbudo azul; NICARGUA: Barbudo seis barbas.

**Literature:** Motomura, Kimura and Iwatsuki (2002).

**Remarks:** ***P. californiensis***, originally described by Thominot (1886) from California, USA on the basis of a single specimen (MNHN 1884-487, 179 mm standard length), was recently synonymized under ***P. approximans***, originally described by Lay and Bennett (1839) on the basis of a brief sketch and description by Mr Collie (Motomura, Kimura and Iwatsuki 2002). Although Lay and Bennett (1839) quoted the absence of a swimbladder in the species from the brief description by Mr Collie, the presence of a swimbladder was confirmed by Motomura, Kimura and Iwatsuki (2002). The swimbladder was apparently overlooked by Mr Collie due to its very small size (about 13% of standard length).

***Polydactylus approximans*** and 6 Indo-Pacific ***Polydactylus*** species, ***P. longipes***, ***P. malagasyensis***, ***P. nigripinnis***, ***P. persicus***, ***P. sexfilis*** and ***P. sextarius***, are characterized by having 6 pectoral filaments. However, ***P. approximans*** is distinguished from the other 6 species by having a bifurcated lateral line (unbranched in the latter). The lateral-line condition of ***P. approximans*** is also found in an Indian Ocean species, ***P. bifurcus***, and all 3 currently-recognized Atlantic west coast species, ***P. octonemus***, ***P. oligodon*** and ***P. virginicus***. ***Polydactylus approximans*** differs from the above 4 species in

having usually 6 pectoral filaments (5 in ***P. bifurcus***, usually 7 in ***P. oligodon*** and ***P. virginicus***, and usually 8 in ***P. octonemus***.

***Polydactylus approximans*** has the maxilla without scales, a character state also found in the 3 Atlantic west coast species and an African west coast species, ***P. quadrifilis***. Other congeners (distributed in the Indo-Pacific and eastern Pacific) have the maxilla with deciduous scales, the size and number of scales being both intra- and interspecifically variable.

***Polydactylus approximans*** and ***P. opercularis*** occur in the eastern Pacific Ocean. The former can be easily distinguished from the latter by having lower counts of pectoral filaments [6 on each side (rarely 5 on each side or asymmetrically 6 and 7) versus 9 on each side (rarely 8 on each side or asymmetrically 8 and 9) in the latter], pored lateral-line scales [56 to 63 (mode 60) versus 66 to 74 (mode 70)], scale rows above and below the lateral line [7 or 8 (mode 7) and 11 to 13 (mode 12) versus 7 to 10 (mode 8) and 12 to 15 (mode 13), respectively] and gillrakers [upper series 11 to 14 (mode 13), lower 15 to 18 (mode 17) and total 26 to 31 (mode 30) versus 13 to 18 (mode 16), 17 to 20 (mode 19) and 31 to 37 (mode 34), respectively], and higher counts of anal-fin soft rays [13 to 15 (mode 14) versus 12 to 14 (mode 13)].

In addition to the above meristic characters, ***P. approximans*** differs from ***P. opercularis*** in having the following distinct morphological characters: lip on lower jaw well developed, dentary teeth restricted to dorsal surface (anterior parts of lower jaw with villiform teeth extending onto lateral surface, adjacent portion of lip poorly developed in larger ***P. opercularis***); maxilla not covered with scales (covered with small deciduous scales in ***P. opercularis***); lateral line bifurcated on caudal-fin membranes, extending to posterior margins of upper and lower caudal-fin lobes (lateral line unbranched, extending to upper end of lower caudal-fin lobe in ***P. opercularis***); swimbladder present (absent in ***P. opercularis***).

## ***Polydactylus bifurcus*** Motomura, Kimura and Iwatsuki, 2001 — **Fig. 89; Plate IIg**

***Polydactylus bifurcus*** Motomura, Kimura and Iwatsuki, 2001: 299, figs. 1-3 [type locality: Kuta beach, Lombok Island, Indonesia; holotype (NSMT-P 60494, 144 mm standard length)].

**Synonyms:** None.

**FAO Names: En** - Slender fivefinger threadfin; **Fr** - Barbure svelte; **Sp** - Barbudo esbelto.

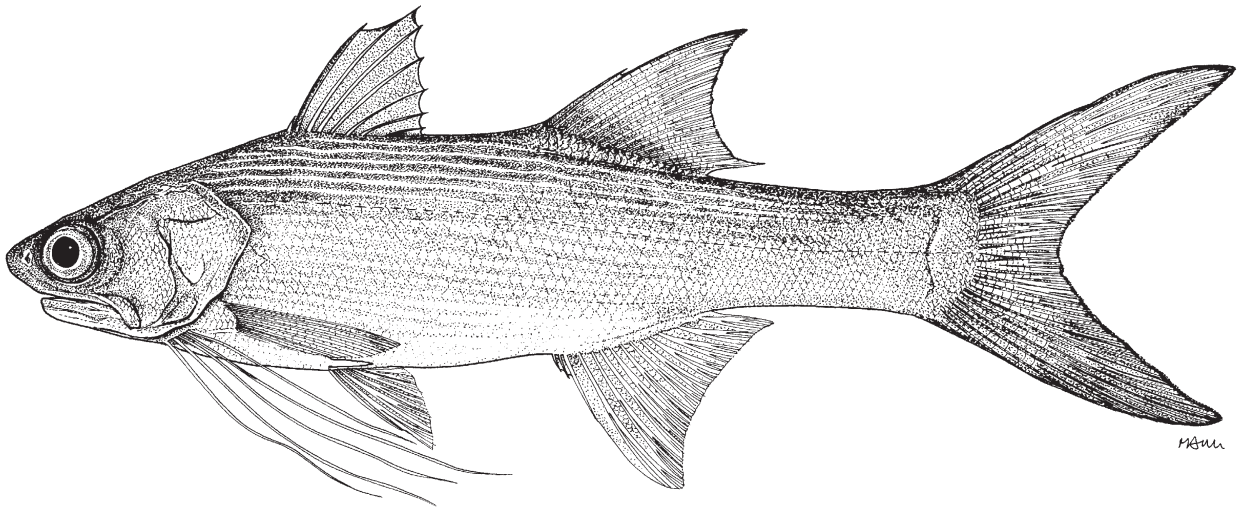

**Fig. 89** ***Polydactylus bifurcus***

**Diagnostic Features:** A medium-sized species. Body depth at first dorsal-fin origin 26 to 28% (mean 27%) of standard length; head length 27 to 28% (mean 28%) of standard length. Snout pointed; occipital profile nearly straight. Posterior margin of maxilla extending slightly beyond level of posterior margin of adipose eyelid; depth of posterior margin of maxilla less than eye diameter; upper-jaw length 14% of standard length; lip on lower jaw well developed, dentary teeth restricted to dorsal surface; teeth villiform in broad bands on vomer, palatines and ectopterygoids. Posterior margin of preopercle serrated. First dorsal fin with VIII spines, second spine more robust than others; second dorsal fin with I spine and 13 soft rays; anal fin with III spines and 11 or 12 (mode 11) soft rays, anal-fin base approximately equal to second dorsal-fin base; pectoral fin with 15 rays (several rays branched), its length 19 to 21% (mean 20%) of standard length, posterior tip not reaching to level of posterior tip of pelvic fin; pectoral filaments 5, first filament shortest, not extending beyond level of

posterior tip of pelvic fin; second, third, and fifth filaments not extending beyond level of posterior tip of pelvic fin; fourth filament longest, its length 35 to 38% (mean 36%) of standard length, extending well beyond level of posterior tip of pelvic fin, but not reaching to level of anal-fin origin; caudal fin deeply forked, upper and lower caudal-fin lobes not filamentous, upper caudal-fin lobe 37 to 39% (mean 38%) and lower lobe 37% of standard length. Pored lateral-line scales 69 to 72; lateral line bifurcated on caudal-fin base, extending to posterior margins of upper and lower caudal-fin lobes; scale rows above lateral line 8 or 9 (mode 8), below 10 to 12 (mode 12). Gillrakers 12 or 13 (mode 13) on upper limb, 17 or 18 (mode 17) on lower limb, 30 total. Vertebrae 10 precaudal and 14 caudal; supraneural bones 3. Swimbladder present, well developed. **Colour:** Upper sides of head and trunk tinged silvery green, becoming more silver on lower sides; first and second dorsal fins dark green; pectoral fin white, becoming dark green on posterior tip; pectoral filaments and pelvic fin white; anterior part of anal fin dark green, remainder of fin white; upper, lower and posterior margins of caudal fin black, remainder of fin dark green (lower lobe darkest); 8 or 9 dark stripes along longitudinal scale rows above lateral line, 8 or 9 faint stripes below.

**Geographical Distribution:** Currently known only from the south coast of the Greater Sunda Islands: Nias, Java and Lombok Island (Fig. 90).

**Habitat and Biology:** Collection data for the holotype indicated that it was taken in shallow water (1.5 m) over a muddy bottom (Motomura, Kimura and Iwatsuki, 2001). No other data are available.

**Size:** Maximum standard length at least 27 cm (Motomura, 2002).

**Interest to Fisheries:** None.

**Local Names:** None known.

**Literature:** Motomura, Kimura and Iwatsuki (2001); Motomura (2002).

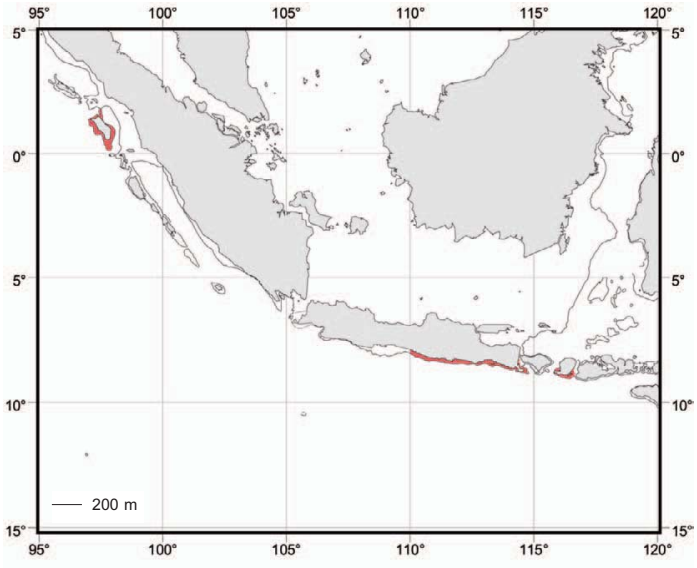


**Fig. 90** ***Polydactylus bifurcus***
Known distribution

**Remarks:** ***P. bifurcus*** can be distinguished from all other Indo-Pacific ***Polydactylus*** species by having the lateral line bifurcated on the caudal-fin base, extending to the posterior margins of the upper and lower caudal-fin lobes (an unbranched lateral line in all other ***Polydactylus***). However, 1 of 2 eastern Pacific species, ***P. approximans***, and all of 3 Atlantic west coast species, ***P. octonemus***, ***P. oligodon*** and ***P. virginicus***, have a similar lateral line condition to ***P. bifurcus***. ***Polydactylus bifurcus*** differs from the above 4 species in having 5 pectoral filaments (usually 6 in ***P. approximans***, 8 in ***P. octonemus***, and 7 in ***P. oligodon*** and ***P. virginicus***). ***Polydactylus approximans*** rarely has 5 pectoral filaments, but the species is clearly distinguished from ***P. bifurcus*** by the numbers of the pored lateral-line scales and anal-fin soft rays (55 to 60 and 13 or 14 versus 69 to 72 and 11 or 12, respectively, in the latter). The lateral lines of the other eastern Pacific species, ***P. opercularis***, and 1 West African species, ***P. quadrifilis***, are unbranched and extend to the upper end of the lower caudal-fin lobe.

Five species have been recognized as valid Indo-Pacific ***Polydactylus*** species with 5 pectoral filaments: ***P. bifurcus***, ***P. macrochir***, ***P. microstomus***, ***P. plebeius*** and ***P. siamensis***. ***Polydactylus bifurcus*** further differs from ***P. microstomus*** in having higher counts of pored lateral-line scales and scales above and below the lateral line (69 to 72 and 8 or 9 / 10 to 12, respectively versus 46 to 49 and 6 or 7 / 8 to 10, in the latter), fourth pectoral filaments longest (fifth longest in the latter), teeth present on the vomer (absent in the latter) and a large black spot absent anteriorly on the lateral line (present, in the latter).

Like ***P. bifurcus***, ***P. plebeius*** and ***P. siamensis*** are characterized by several dark stripes along the longitudinal scale rows above and below the lateral line and 5 pectoral filaments. However, ***P. bifurcus*** is distinguished from the others by having higher counts of the pored lateral-line scales (69 to 72 versus 60 to 66, rarely 68 and 54 to 58 in ***P. plebeius*** and ***P. siamensis***, respectively), fourth pectoral filaments longest (fifth longest in ***P. plebeius*** and ***P. siamensis***) and a very strong second spine of the first dorsal fin (more robust than other spines of first dorsal fin versus similar to other spines).

***Polydactylus bifurcus*** is similar to ***P. macrochir*** in having higher counts of pored lateral-line scales and scales above and below the lateral line, fourth pectoral filaments longest, teeth present on the vomer, and a very strong second spine of the first dorsal fin. However, the former differs from the latter in having the posterior margin of the maxilla extending slightly beyond the level of the posterior margin of the adipose eyelid (extending considerably beyond in the latter) and lower counts of gillrakers (30 versus 32 to 35 in ***P. macrochir***).

***Polydactylus bifurcus*** appears to be one of the rarest polynemids and only 3 specimens are present in museum collections (NSMT-P 60494, holotype, 144 mm standard length; ZMA 114-500, 272 mm standard length; ZMA 116-717, 199 mm standard length).