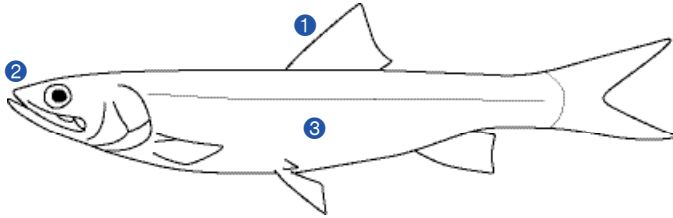


GUIDE TO THE FAMILIES OF BONY FISHES

PANDUAN UNTUK FAMILI IKAN BERTULANG

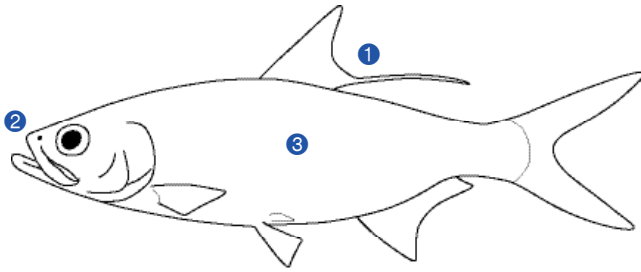
Order Elopiformes

1 – Family Elopidae (giant herrings, p. 70)



- ① single dorsal fin
sirip punggung tunggal
- ② mouth terminal
mulut diujung
- ③ small scales
sisik-sisik kecil

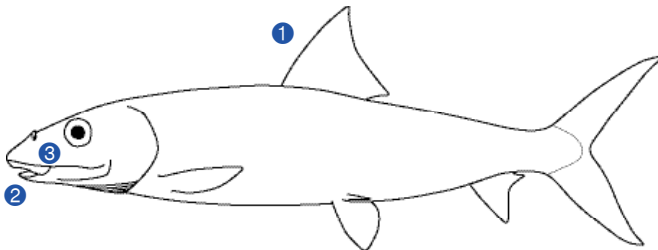
2 – Family Megalopidae (tarpons, p. 70)



- ① single dorsal fin with long posterior filament
sirip punggung tunggal dengan filamen panjang di belakang
- ② mouth terminal
mulut diujung
- ③ large scales
sisik-sisik besar

Order Albuliformes

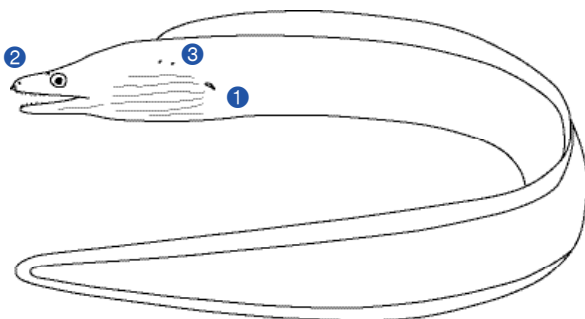
3 – Family Albulidae (bonefishes, p. 70)



- ① single dorsal fin
sirip punggung tunggal
- ② mouth inferior
mulut di bawah
- ③ mouth not reaching past anterior eye
mulut tidak sampai mencapai mata bagian depan

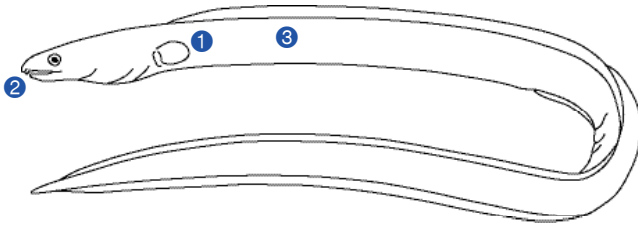
Order Anguilliformes

4 – Family Muraenidae (moray eels, p. 70)



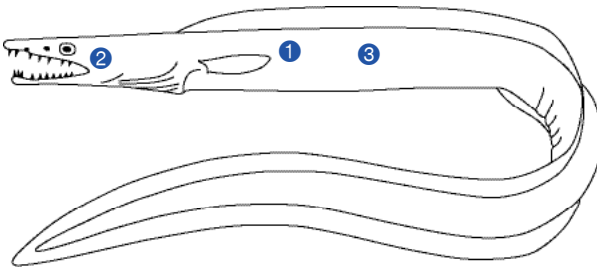
- ① no pectoral fins
tanpa sirip dada
- ② posterior nostril high on head
lubang hidung bagian belakang tinggi di atas kepala
- ③ usually 1–2 lateral-line pores
biasanya 1–2 pori-pori pada gurat sisi

5 – Family Ophichthidae (snake eels, p. 72)



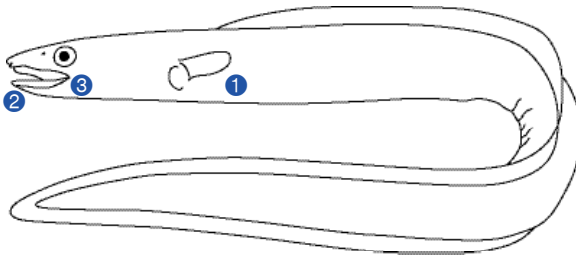
- ① usually with pectoral fins
biasanya dengan sirip dada
- ② posterior nostril low on head
lubang hidung bagian belakang dibawah kepala
- ③ lateral line complete
gurat sisi lengkap

6 – Family Muraenesocidae (pike congers, p. 74)



- ① pectoral fins present
terdapat sirip dada
- ② mouth extends past eye
mulut sampai melewati mata
- ③ lateral line complete
gurat sisi lengkap

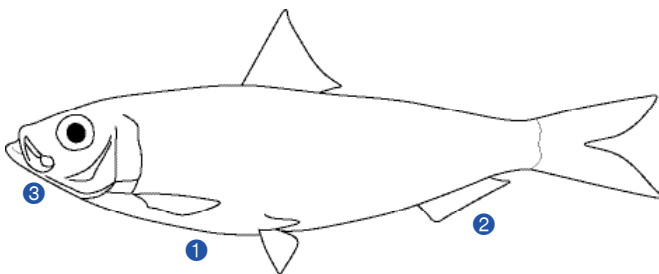
7 – Family Congridae (conger eels, p. 74)



- ① pectoral fins present
terdapat sirip dada
- ② lips usually well developed
bibir biasanya berkembang dengan baik
- ③ mouth not extending past eye
mulut tidak sampai melewati mata

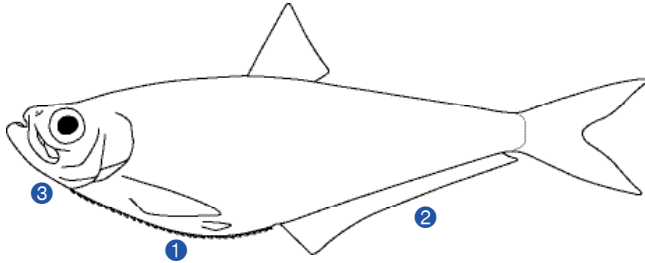
Order Clupeiformes

8 – Family Clupeidae (sardines, sardinellas, p. 76)



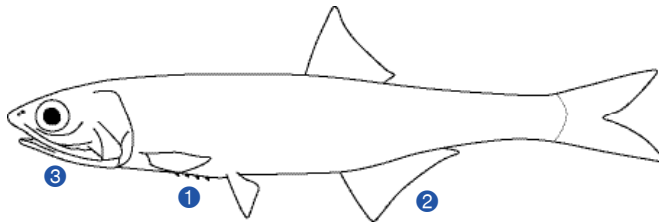
- ① scutes present
terdapat sisik tebal
- ② anal fin moderately long
sirip dubur agak panjang
- ③ upper jaw not extending past anterior of mid-eye
rahang atas bagian depan tidak melewati bagian tengah mata

9 – Family Pristigasteridae (ilishas, pelloas, p. 78)



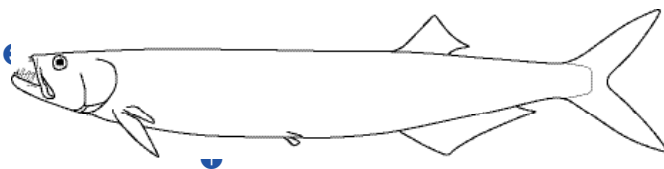
- ① scutes present
terdapat sisik tebal
- ② anal fin very long
sirip dubur sangat panjang
- ③ upper jaw not extending past mid-eye
rahang atas tidak melewati bagian tengah mata

10 – Family Engraulidae (anchovies, p. 80)



- ① scutes usually present
biasanya terdapat sisik tebal
- ② anal fin moderately long
sirip dubur agak panjang
- ③ upper jaw extending well past eye
rahang atas jauh melewati ujung mata

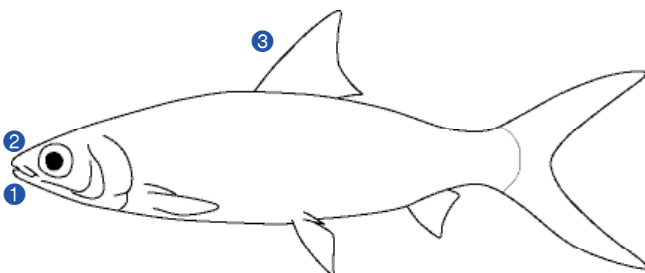
11 – Family Chirocentridae (wolf-herrings, p. 82)



- ① scutes absent
tidak ada sisik tebal
- ② dorsal fin set far back
letak sirip punggung jauh ke belakang
- ③ teeth very large, fang-like
gigi sangat besar, menyerupai taring

Order Gonorynchiformes

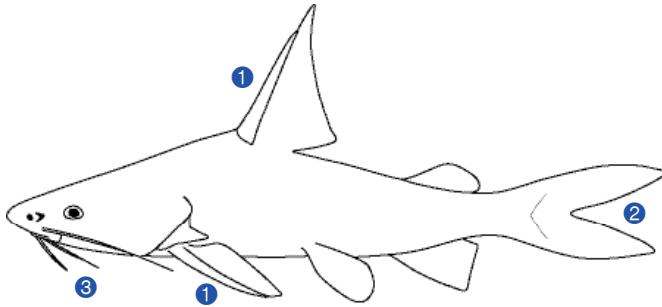
12 – Family Chanidae (Milkfish, p. 82)



- ① mouth small, terminal
mulut kecil, diujung
- ② jaws toothless
rahang tanpa gigi
- ③ single dorsal fin
sirip punggung tunggal

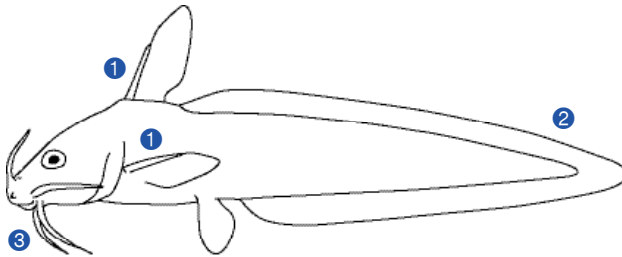
Order Siluriformes

13 – Family Ariidae (sea catfishes, p. 82)



- ① strong spine in front of dorsal and pectoral fins
duri keras di depan sirip punggung dan sirip dada
- ② caudal fin forked
sirip ekor bercagak
- ③ usually 3 pairs of barbels
biasanya terdapat 3 pasang sungut

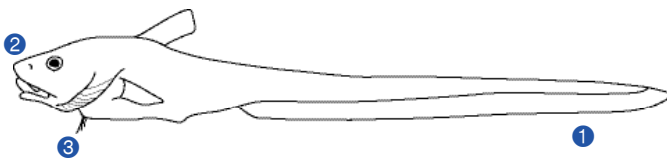
14 – Family Plotosidae (eeltail catfishes, p. 84)



- ① strong spine in front of dorsal and pectoral fins
duri keras di depan sirip punggung dan sirip dada
- ② tail eel-like
ekor menyerupai belut
- ③ 4 pairs of barbels
4 pasang sungut

Order Ateleopodiformes

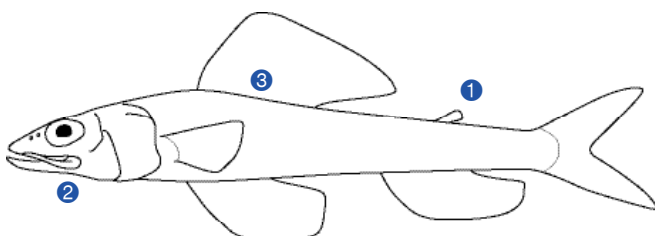
15 – Family Ateleopodidae (jellynoses, p. 84)



- ① elongate anal fin united with caudal fin
sirip dubur memanjang bersatu dengan sirip ekor
- ② snout gelatinous
moncong seperti agar-agar
- ③ pelvic fins with a single ray
sirip perut dengan jari-jari tunggal

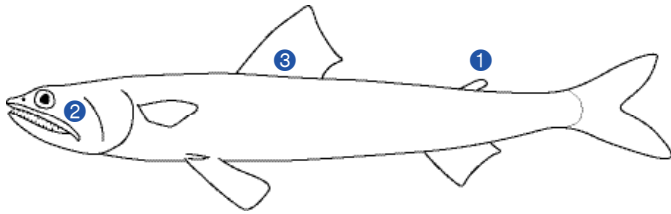
Order Aulopiformes

16 – Family Aulopidae (threadsails, p. 84)



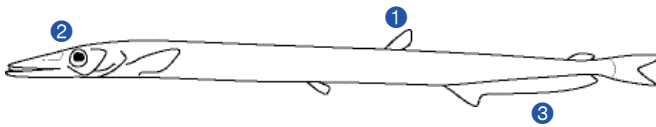
- ① adipose fin present
terdapat sirip adiposa
- ② upper jaw not extending past end of eye
rahang atas tidak sampai melewati ujung mata
- ③ dorsal fin moderately long
sirip punggung agak panjang

17 – Family **Synodontidae** (lizardfishes, p. 84)



- ① adipose fin present
terdapat sirip adiposa
- ② upper jaw extending well past end of eye
rahang atas jauh melewati ujung mata
- ③ dorsal fin short
sirip punggung pendek

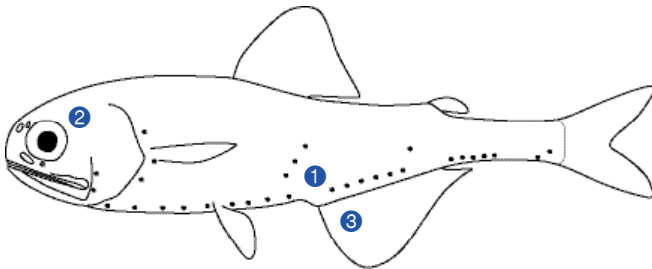
18 – Family **Paralepididae** (barracudinas, p. 90)



- ① dorsal fin small, posteriorly placed
sirip punggung kecil, terletak dibelakang
- ② head long
kepala panjang
- ③ anal fin long
sirip dubur panjang

Order Myctophiformes

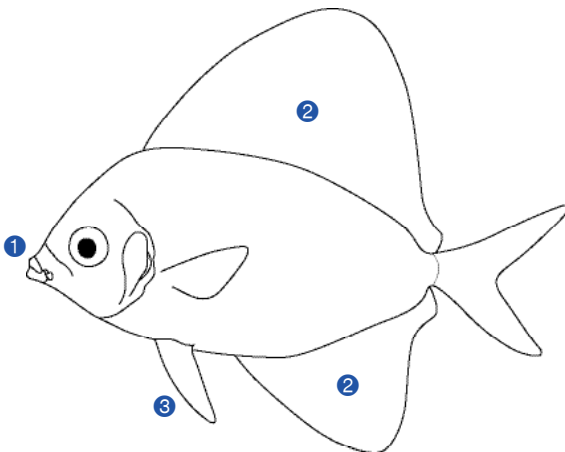
19 – Family **Myctophidae** (lanternfishes, p. 90)



- ① photophores present on body
terdapat photophores pada tubuh
- ② eye longer than snout
ukuran mata lebih panjang dari pada moncong
- ③ anal fin behind dorsal-fin base
sirip dubur dibelakang dasar sirip punggung

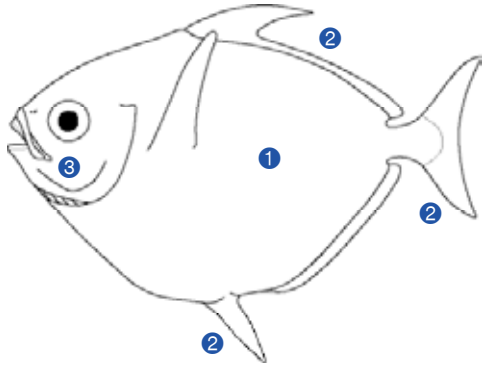
Order Lampridiformes

20 – Family **Veliferidae** (velifers, p. 90)



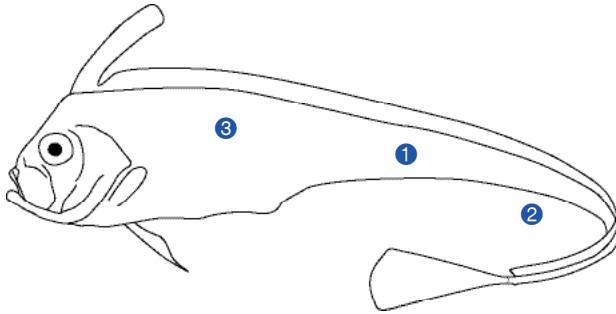
- ① upper jaw protrusible
rahang atas protrusible
- ② dorsal and anal fins long, sail-like
sirip punggung dan dubur panjang, menyerupai layar
- ③ no spines in pelvic fins
tanpa duri pada sirip perut

21 – Family Lampridae (opahs, p. 90)



- ① body oval, often with white spots
tubuh lonjong, sering terdapat bintik-bintik putih
- ② fins red
sirip merah
- ③ mouth not extending past anterior eye
mulut tidak sampai melewati mata bagian depan

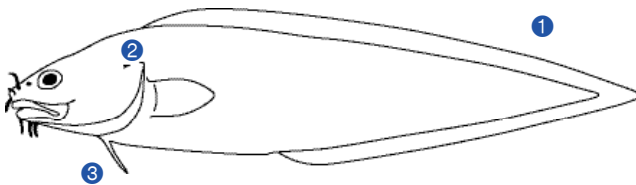
22 – Family Trachipteridae (ribbonfishes, p. 90)



- ① body very long, tapering, ribbon-like
tubuh sangat panjang, menyempit, menyerupai pita
- ② anal fin absent
tidak ada sirip dubur
- ③ skin with bony raised tubercles
kulit dengan tuberkulum terangkat bertulang

Order Ophidiiformes

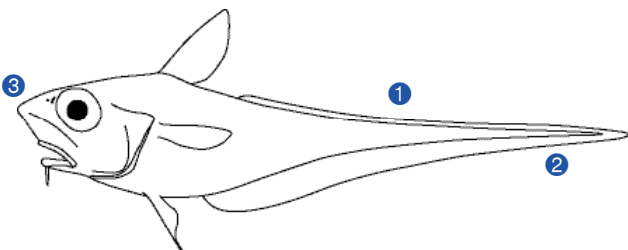
23 – Family Ophidiidae (cusk eels, p. 90)



- ① tail eel-like
ekor menyerupai belut
- ② spine on opercle
duri pada tutup insang
- ③ 0–2 pelvic-fin rays
0–2 jari-jari sirip perut

Order Gadiformes

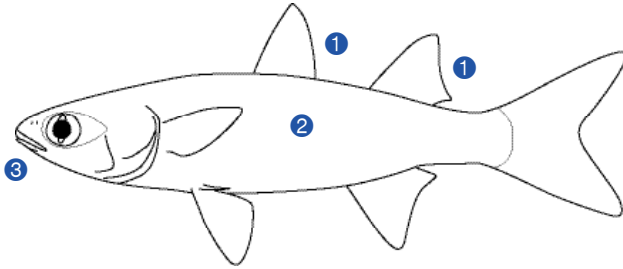
24 – Family Macrouridae (grenadiers, p. 92)



- ① elongate tapering tail
ekor memanjang menyempit
- ② dorsal and anal fins very long, meeting at tail
sirip punggung dan dubur amat panjang, bertemu di ekor
- ③ protruding snout, often bony
moncong menonjol, sering bertulang

Order Mugiliformes

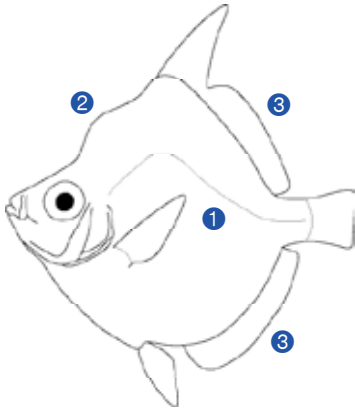
25 – Family Mugilidae (mulletts, p. 92)



- ① 2 widely separate dorsal fins
2 sirip punggung terpisah lebar
- ② silvery with large scales
keperakan dengan sisik-sisik besar
- ③ mouth small, teeth very small or absent
mulut kecil, gigi sangat kecil atau tidak ada

Order Zeiformes

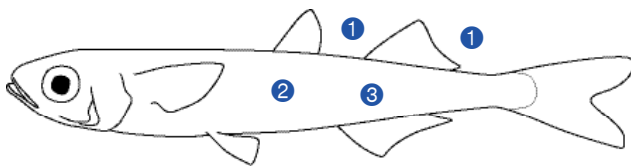
26 – Family Caproidae (deepsea boarfishes, p. 94)



- ① body very deep, compressed
tubuh sangat lebar, pipih
- ② nape with conspicuous hump
tengkuk dengan punuk mencolok
- ③ dorsal and anal fins long
sirip punggung dan dubur panjang

Order Atheriniformes

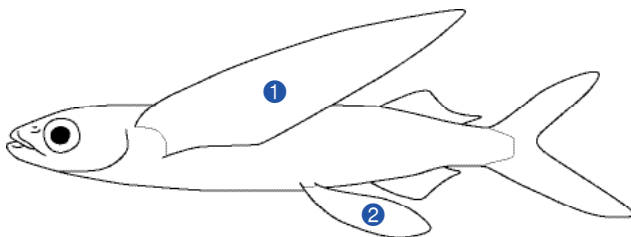
27 – Family Atherinidae (silversides, p. 94)



- ① 2 dorsal fins
2 sirip punggung
- ② typically with silvery band on side of body
biasanya dengan baris keperakan di sisi tubuh
- ③ scales relatively large
sisik-sisik relatif besar

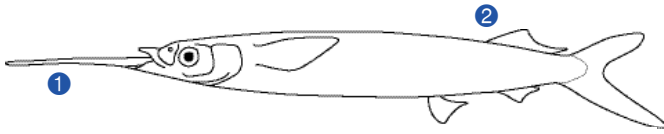
Order Beloniformes

28 – Family Exocoetidae (flyingfishes, p. 96)



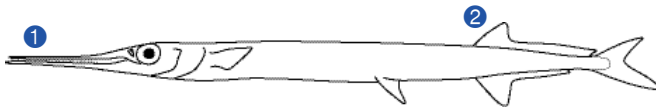
- ① pectoral fins very large, wing-like
sirip dada sangat besar, menyerupai sayap
- ② pelvic fins often large
sirip perut biasanya lebar

29 – Family Hemiramphidae (halfbeaks, p. 98)



- ① lower jaw very prolonged, without teeth
rahang bawah sangat panjang, tanpa gigi
- ② single dorsal fin, placed posteriorly
sirip punggung tunggal, terletak di belakang

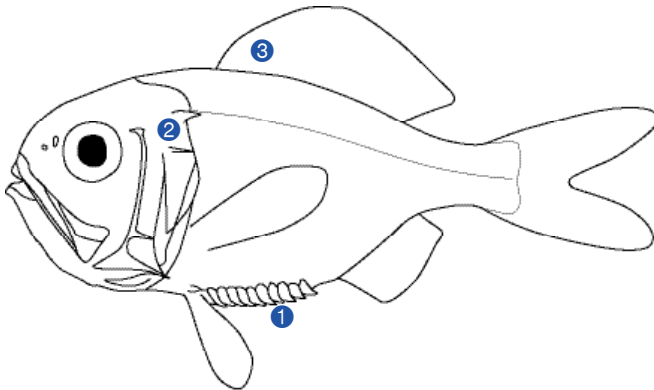
30 – Family Belonidae (needlefishes, p. 100)



- ① jaws prolonged with many large teeth
rahang panjang dengan banyak gigi besar
- ② single dorsal fin, placed posteriorly
sirip punggung tunggal, terletak di belakang

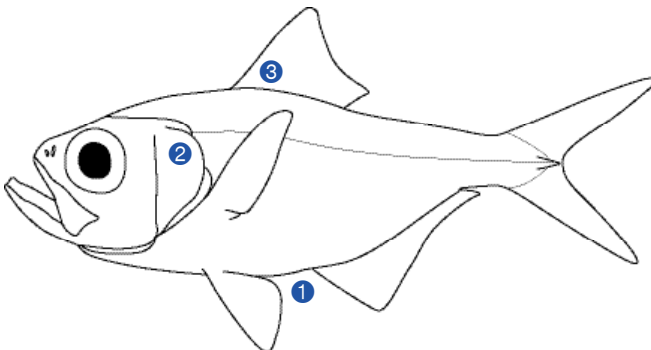
Order Beryciformes

31 – Family Trachichthyidae (roughies, p. 104)



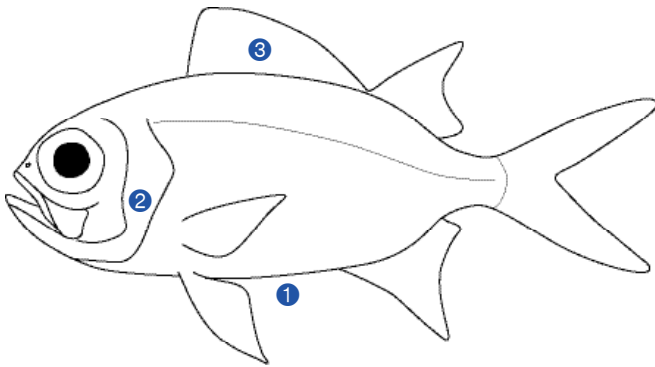
- ① ventral keel of large scutes
lunas perut tersusun dari sisik besar
- ② triangular preopercular spine present
terdapat tulang segitiga pada depan tutup insang
- ③ spinous part of dorsal fin short
bagian benduri pada sirip punggung pendek

32 – Family Berycidae (alfonsinos, p. 104)



- ① no ventral keel of scutes
tanpa sisik pada lunas perut
- ② no large preopercular spine
tanpa duri besar pada depan tutup insang
- ③ spinous part of dorsal fin short
bagian benduri pada sirip punggung pendek

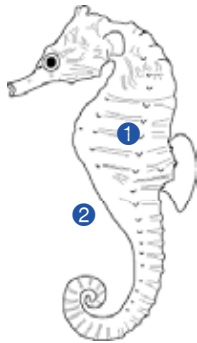
33 – Family Holocentridae (squirrelfishes, p. 104)



- ① no ventral keel of scutes
tanpa sisik pada lunas perut
- ② preopercular spine sometimes present
kadang-kadang terdapat duri di depan tutup insang
- ③ spinous part of dorsal fin longer than soft portion
bagian berduri pada sirip punggung lebih panjang daripada bagian yang lunak

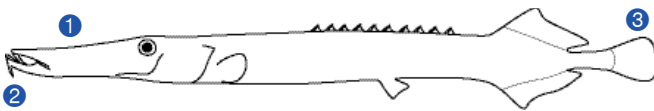
Order Gasterosteiformes

34 – Family Syngnathidae (pipefishes, seahorses, p. 108)



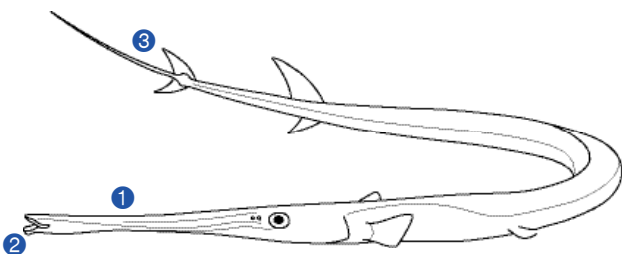
- ① body encased in many bony plates
tubuh terbungkus banyak lempeng bertulang
- ② pelvic fin absent
tidak ada sirip perut

35 – Family Aulostomidae (trumpetfishes, p. 110)



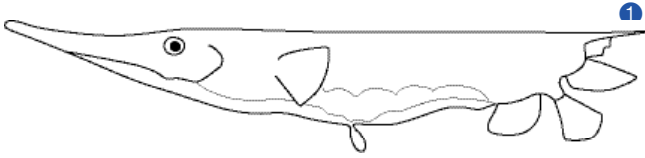
- ① snout long, trumpet-shaped
moncong panjang, berbentuk terompet
- ② barbel on chin
sungut pada dagu
- ③ caudal fin rounded
sirip ekor bulat

36 – Family Fistulariidae (flutemouths, p. 110)



- ① snout very long, tube-like
moncong sangat panjang, menyerupai tabung
- ② no barbel on chin
tanpa sungut pada dagu
- ③ caudal fin forked, with long central filament
sirip ekor bercagak, dengan filamen tengah panjang

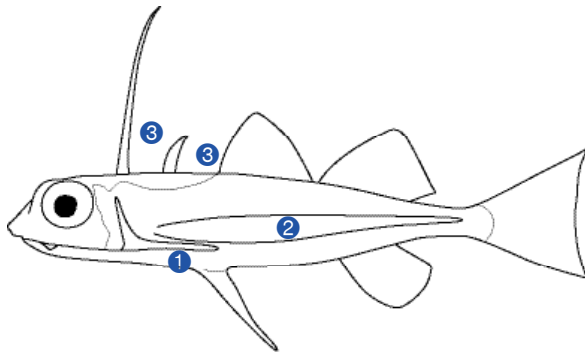
37 – Family Centriscidae (razorfishes, p. 110)



- ① 1st dorsal spine enlarged, at end of body
duri punggung pertama besar, di akhir tubuh
- ② body extremely compressed, blade-like
tubuh sangat pipih, seperti pisau

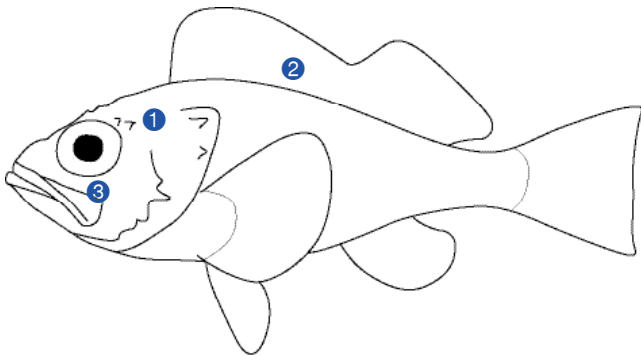
Order Scorpaeniformes

38 – Family Dactylopteridae (flying gurnards, p. 110)



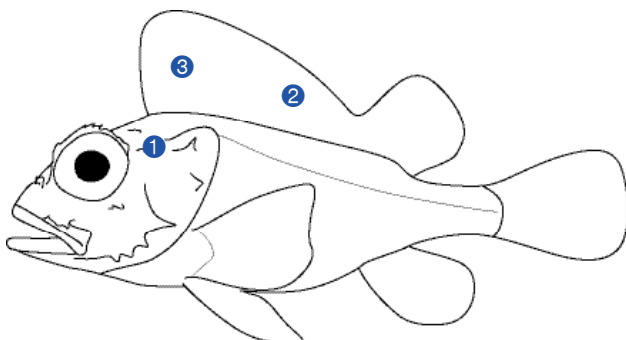
- ① preopercle with a very large spine
depan tutup insang dengan duri sangat besar
- ② pectoral fins greatly enlarged, divided
sirip dada amat membesar, terpisah
- ③ spinous dorsal fin in 2 or 3 sections
duri sirip punggung dalam 2 atau 3 bagian

39 – Family Sebastidae (ocean perches, p. 112)



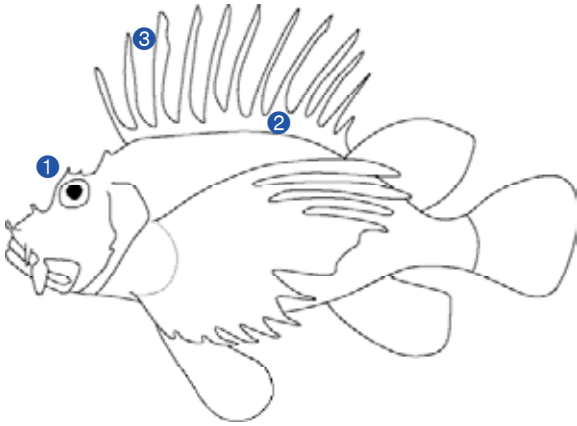
- ① head with many spines
kepala dengan banyak duri
- ② 1 dorsal fin
1 sirip punggung
- ③ 3rd suborbital bone inclined ventrally
tulang infraorbital ke-3 mengarah ke bagian perut

40 – Family Neosebastidae (gurnard perches, p. 112)



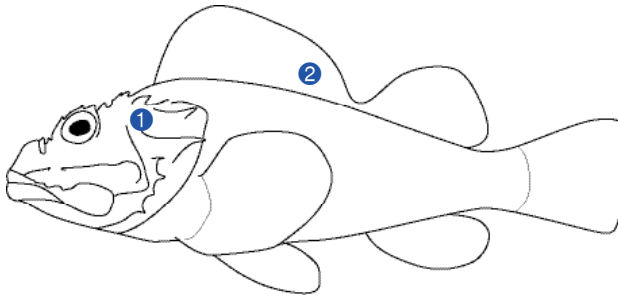
- ① head with many spines
banyak duri pada kepala
- ② 1 dorsal fin
1 sirip punggung
- ③ longest dorsal spines equal to body depth
duri punggung terpanjang sama dengan lebar tubuh

41 – Family **Pteroidae** (lionfishes, p. 112)



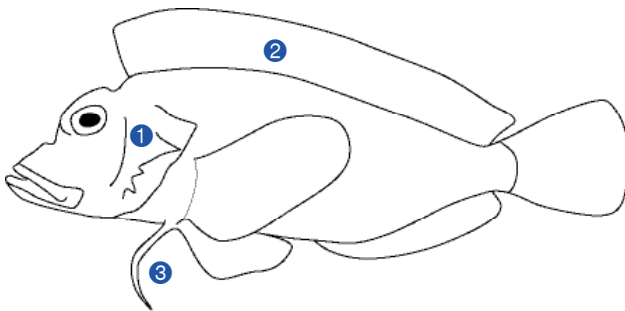
- ① head with many spines
banyak duri pada kepala
- ② 1 dorsal fin
1 sirip punggung
- ③ dorsal fin spines greatly elongate
duri sirip punggung amat memanjang

42 – Family **Scorpaenidae** (scorpionfishes, p. 112)



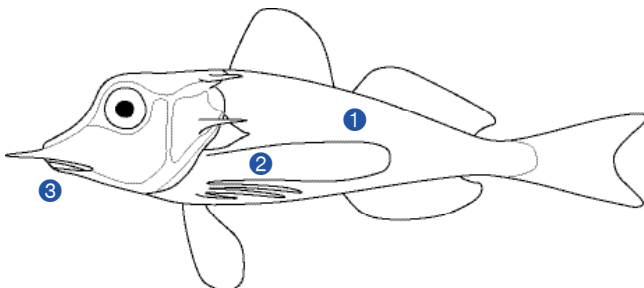
- ① head with many spines
banyak duri pada kepala
- ② 1 dorsal fin
sirip punggung tunggal

43 – Family **Synanceiidae** (stonefishes, p. 116)



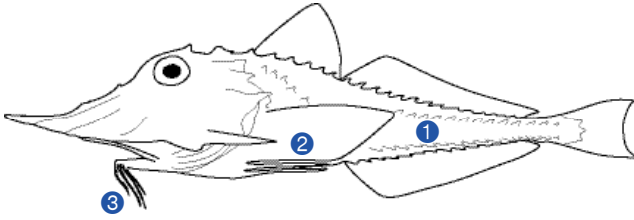
- ① head with many spines
banyak duri pada kepala
- ② 1 dorsal fin
1 sirip punggung
- ③ lower pectoral-fin ray free
jari sirip dada bagian bawah terpisah

44 – Family **Triglidae** (gurnards, p. 116)



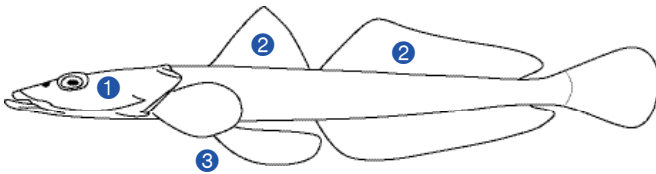
- ① body and tail covered with scales
tubuh dan ekor ditutupi sisik
- ② 3 lower pectoral rays free
3 jari-jari sirip dada bagian bawah terpisah
- ③ no large barbels on chin
tanpa sungut besar pada dagu

45 – Family Peristediidae (armour gurnards, p. 116)



- ① body and tail covered with large bony scutes
tubuh dan ekor ditutupi sisik bertulang yang besar
- ② 2 lower pectoral rays free
2 jari-jari sirip dada bagian bawah terpisah
- ③ large barbels present on chin
terdapat sungut besar pada dagu

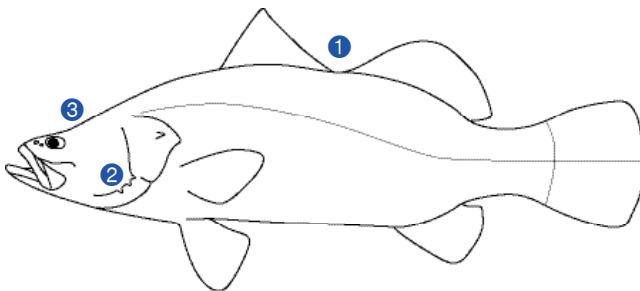
46 – Family Platycephalidae (flatheads, p. 116)



- ① head flattened, with spines and bony ridges
kepala pipih, dengan duri dan punggung kepala bertulang
- ② 2 dorsal fins
2 sirip punggung
- ③ pelvic fins behind pectoral fins
sirip perut di belakang sirip dada

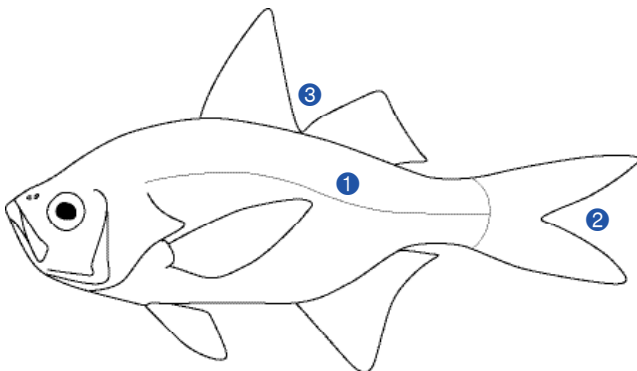
Order Perciformes: Percoidei

47 – Family Latidae (sea perches, p. 120)



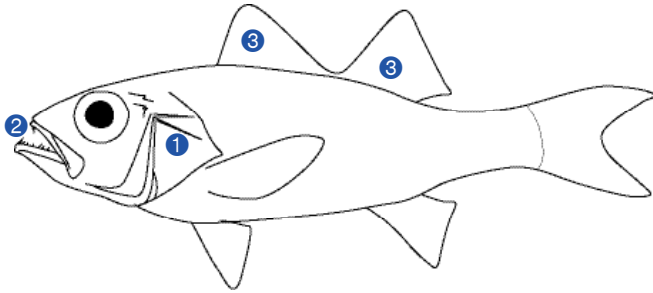
- ① dorsal fin deeply incised
sirip punggung sangat berkelar
- ② preopercle margin serrated
tepi depan tutup insang bergerigi
- ③ head deeply concave behind eye
kepala sangat cekung di belakang mata

48 – Family Ambassidae (glassfishes, p. 120)



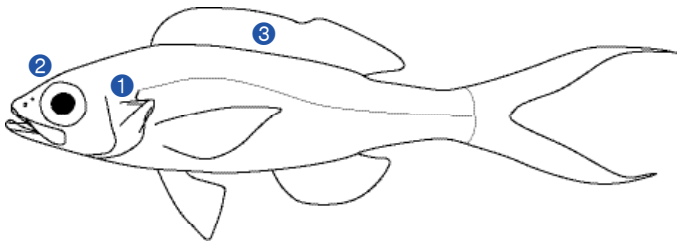
- ① body semitransparent
tubuh semitransparan
- ② caudal fin deeply forked
sirip ekor sangat bercagak
- ③ dorsal fin deeply incised
sirip punggung sangat berkelar

49 – Family Acropomatidae (ocean basses, p. 120)



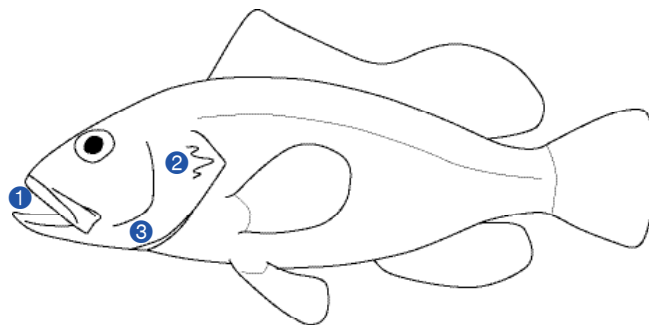
- ① 2 or 3 flat opercular spines
2–3 duri pipih pada tutup insang
- ② lower jaw with spaced canines
rahang bawah dengan gigi taring berjarak
- ③ 2 separate dorsal fins
2 sirip punggung terpisah

50 – Family Symphysanodontidae (slopefishes, p. 122)



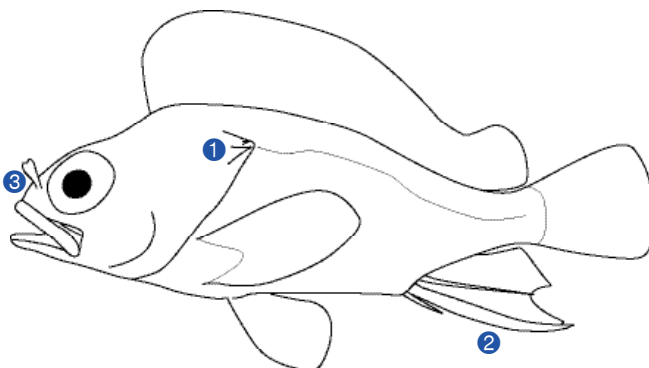
- ① 2 opercular spines
2 duri pada tutup insang
- ② large eye
mata besar
- ③ single dorsal fin, with 9 spines, 10 soft rays
sirip punggung tunggal, dengan 9 duri,
10 jari lunak

51 – Family Serranidae (groupers, sea basses, coral trouts etc., p. 122)



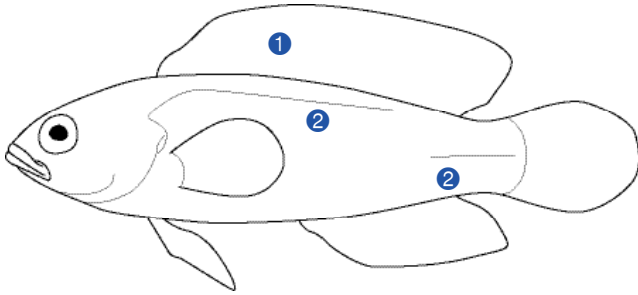
- ① mouth large, maxilla exposed when closed
mulut besar, maksila terlihat ketika
tertutup
- ② 3 flat opercular spines
3 duri pipih pada tutup insang
- ③ margin of preopercle usually serrate
tepi depan tutup insang biasanya bergerigi

52 – Family Centrogenyidae (false scorpionfishes, p. 144)



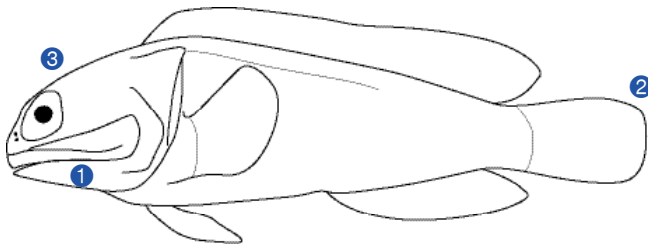
- ① 2 spines on opercle
2 duri pada tutup insang
- ② 2nd anal-fin spine long and robust
duri sirip dubur ke-2 panjang dan kokoh
- ③ anterior nostril with large flap
lubang hidung bagian depan dengan
penutup besar

53 – Family Pseudochromidae (dottybacks, p. 144)



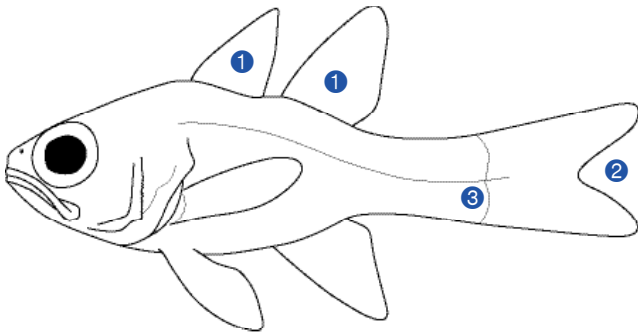
- ① dorsal fin with <3 spines, 21–74 soft rays
sirip punggung dengan <3 duri, 21–74 jari lunak
- ② lateral line usually in two separate parts
gurat sisi biasanya terpisah dua bagian

54 – Family Opistognathidae (jawfishes, p. 146)



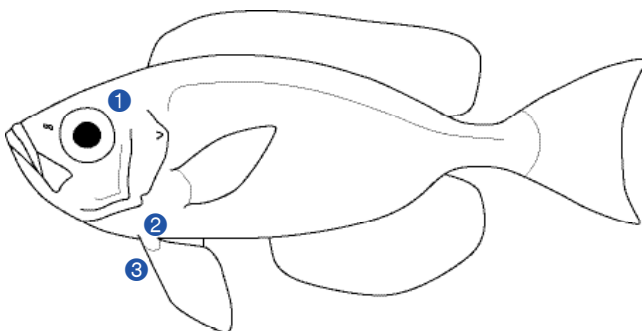
- ① mouth large, extending well past eye
mulut besar, sampai jauh melewati mata
- ② caudal fin rounded
sirip ekor bulat
- ③ head bulbous
kepala bulat

55 – Family Apogonidae (cardinalfishes, p. 146)



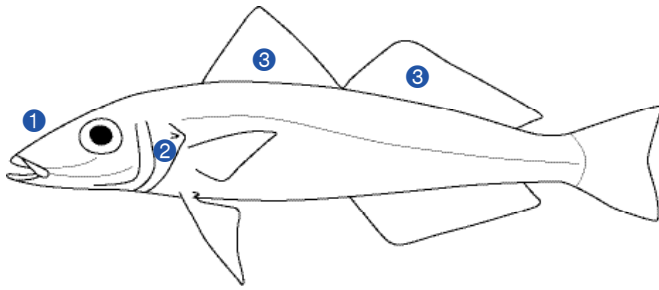
- ① 2 separate dorsal fins
2 sirip punggung terpisah
- ② caudal fin slightly forked to rounded
sirip ekor agak bercagak sampai bulat
- ③ lateral line usually extending onto caudal fin
gurat sisi biasanya sampai sirip ekor

56 – Family Priacanthidae (bigeyes, p. 154)



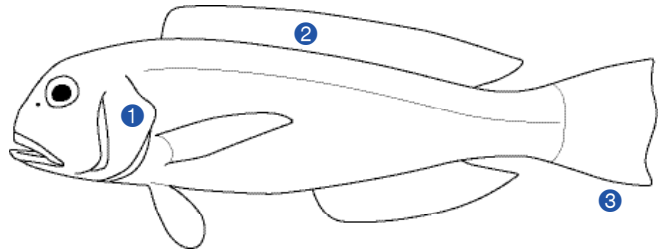
- ① eyes very large
mata sangat besar
- ② pelvic fins in front of pectoral fins
sirip perut di depan sirip dada
- ③ pelvic fins attached to belly by membrane
sirip perut menempel pada perut dengan membran

57 – Family Sillaginidae (whitings, p. 156)



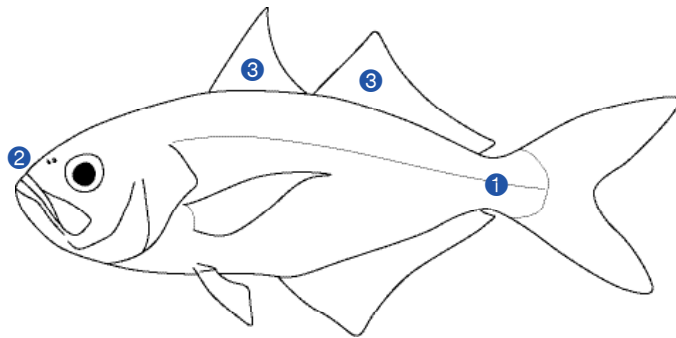
- ① snout long, conical
moncong panjang, berbentuk kerucut
- ② opercle with a sharp spine
tutup insang dengan sebuah duri tajam
- ③ 2 separate dorsal fins
2 sirip punggung terpisah

58 – Family Malacanthidae (tilefishes, p. 156)



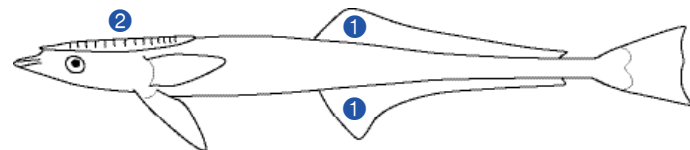
- ① opercle with 1 spine
tutup insang dengan 1 duri
- ② 1 very long dorsal fin
1 sirip punggung sangat panjang
- ③ caudal fin rounded or truncate
sirip ekor bulat atau tegak lurus

59 – Family Lactariidae (False Trevally, p. 158)



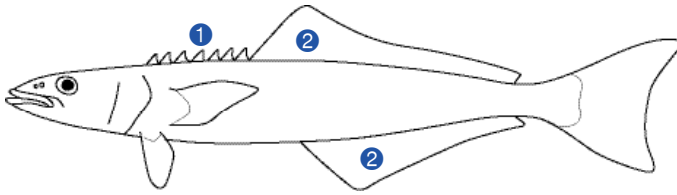
- ① no scutes on caudal peduncle
tanpa sisik tebal di pangkal ekor
- ② pair of canine teeth at front of jaws
sepasang gigi taring pada bagian depan rahang
- ③ 2 separate dorsal fins
2 sirip punggung terpisah

60 – Family Echeneidae (remoras, p. 158)



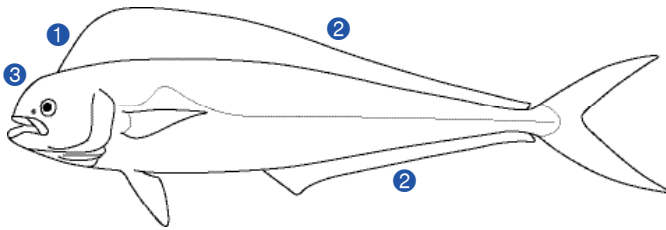
- ① dorsal and anal fins without spines
sirip punggung dan dubur tanpa duri
- ② sucking disc on top of head
lempeng pengisap di atas kepala

61 – Family Rachycentridae (Cobia, p. 160)



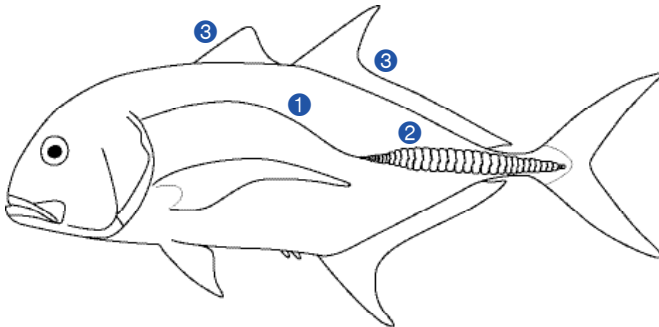
- ① 6–9 separate short spines before dorsal fin
6–9 duri pendek terpisah sebelum sirip punggung
- ② dorsal and anal fins long
sirip punggung dan dubur panjang

62 – Family Coryphaenidae (dolphinfishes, p. 160)



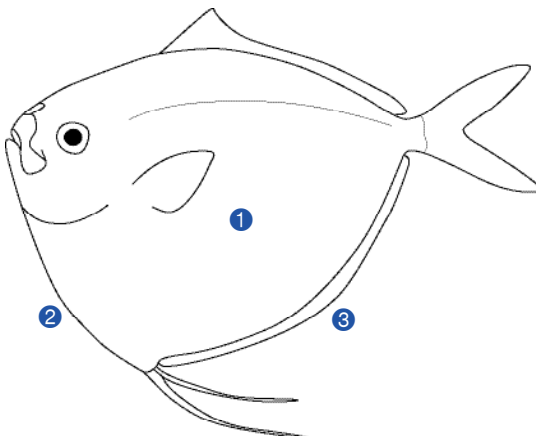
- ① dorsal fin origin above eyes
pangkal sirip punggung di atas mata
- ② dorsal and anal fins very long
sirip punggung dan dubur sangat panjang
- ③ adult males with bony crest on head
jantan dewasa dengan tulang lancip di kepala

63 – Family Carangidae (trevallies, queenfishes, scads etc., p. 160)



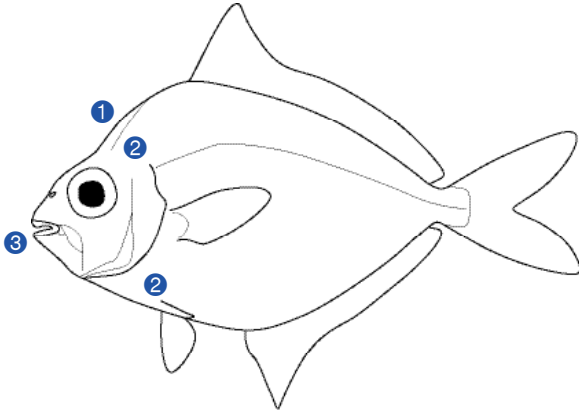
- ① lateral line arched anteriorly, straight posteriorly
gurat sisi melengkung di bagian depan, lurus di belakang
- ② scutes often present on caudal peduncle
sering terdapat sisik tebal pada pangkal ekor
- ③ 2 separate dorsal fins
2 sirip punggung terpisah

64 – Family Menidae (Moonfish, p. 176)



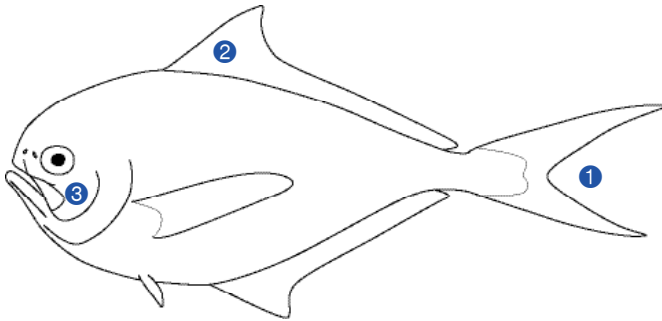
- ① body very deep, triangular
tubuh sangat lebar, berbentuk segitiga
- ② breast sharp-edged
bagian dada bertepi tajam
- ③ anal fin very long
sirip dubur sangat panjang

65 – Family Leiognathidae (ponyfishes, p. 176)



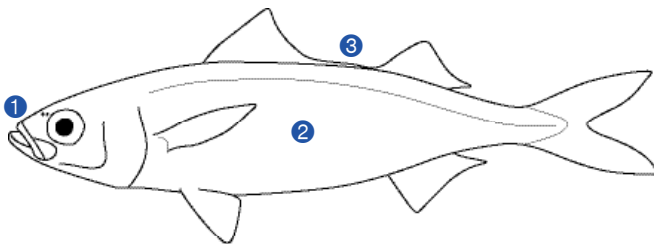
- ① bony crest on nape
tulang lancip pada tengkuk
- ② breast and top of head scaleless
dada dan bagian atas kepala tidak bersisik
- ③ mouth often protrusible
mulut sering protrusible

66 – Family Bramidae (pomfrets, p. 182)



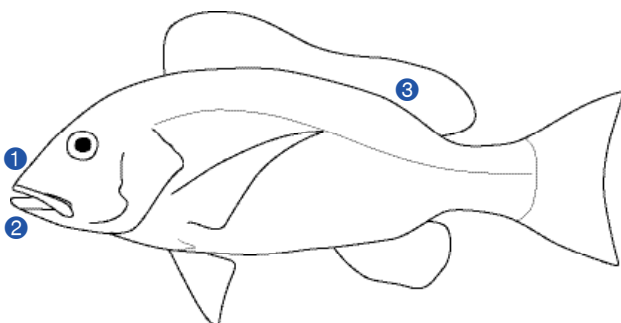
- ① caudal fin strongly forked
sirip ekor amat bercagak
- ② 1 stiff dorsal fin
1 sirip punggung kaku
- ③ maxilla with scales
maksila bersisik

67 – Family Emmelichthyidae (rubyfishes, p. 184)



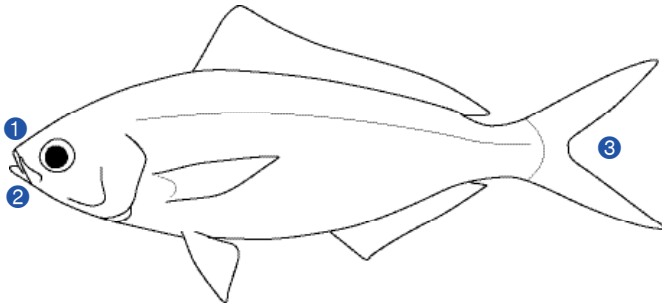
- ① upper jaw highly protrusible
rahang atas sangat protrusible
- ② body slender, elongate
tubuh langsing, memanjang
- ③ dorsal fin deeply notched
sirip punggung sangat berlekuk

68 – Family Lutjanidae (snappers, p. 184)



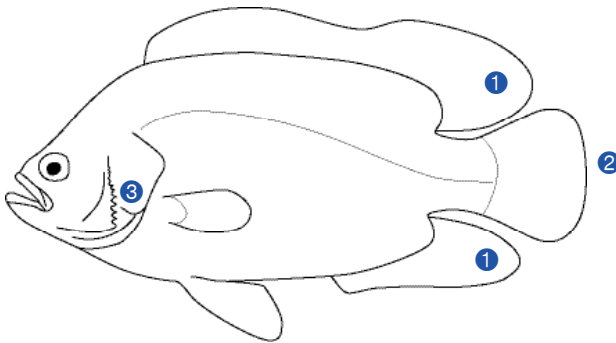
- ① jaws usually with distinct canines
rahang biasanya dengan gigi taring yang berbeda
- ② mouth large
mulut besar
- ③ dorsal fin with 10–17 soft rays
sirip punggung dengan 10–17 jari lunak

69 – Family Caesionidae (fusiliers, p. 200)



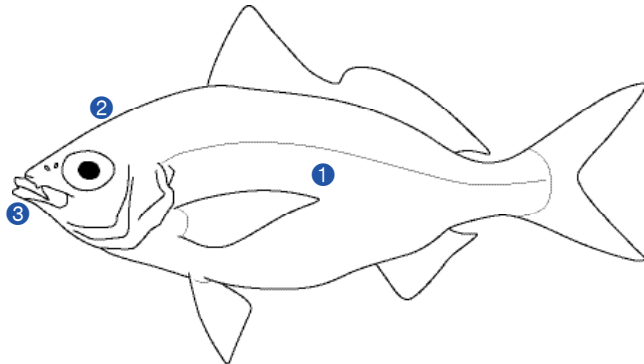
- ① teeth minute
gigi amat kecil
- ② mouth small
mulut kecil
- ③ caudal fin deeply forked
sirip ekor sangat bercagak

70 – Family Lobotidae (tripletails, p. 204)



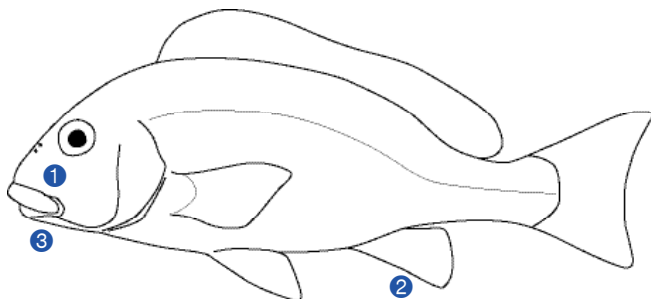
- ① rounded lobes on dorsal and anal fins
kelepak bulat pada sirip punggung dan dubur
- ② caudal fin rounded
sirip ekor bulat
- ③ preopercle strongly serrate
depan tutup insang amat bergerigi

71 – Family Gerreidae (silverbiddies, p. 204)



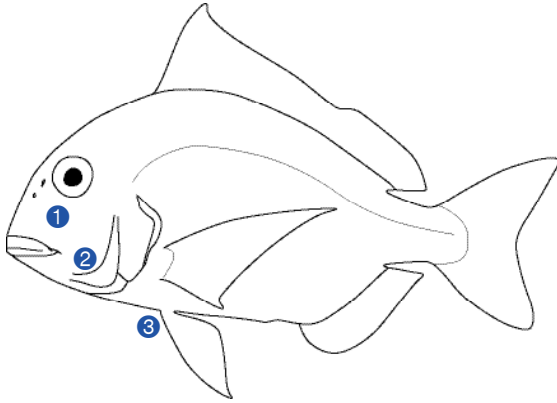
- ① large deciduous scales
sisik besar seperti daun
- ② top of head scaly
atas kepala bersisik
- ③ mouth protrusible
mulut protrusible

72 – Family Haemulidae (sweetlips, p. 206)



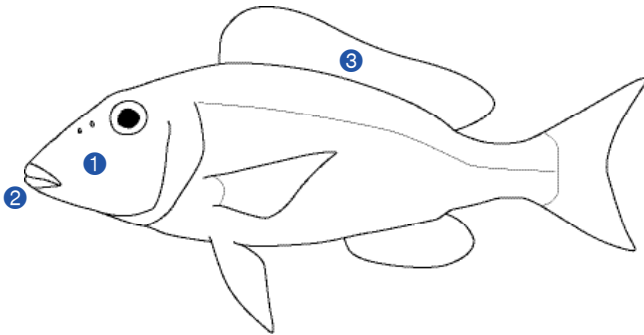
- ① scales present between eye and mouth
terdapat sisik antara mata dan mulut
- ② 2nd anal-fin spine very strong
duri sirip dubur ke-2 sangat kuat
- ③ 2–6 chin pores
2–6 pori-pori pada dagu

73 – Family Sparidae (seabreams, p. 212)



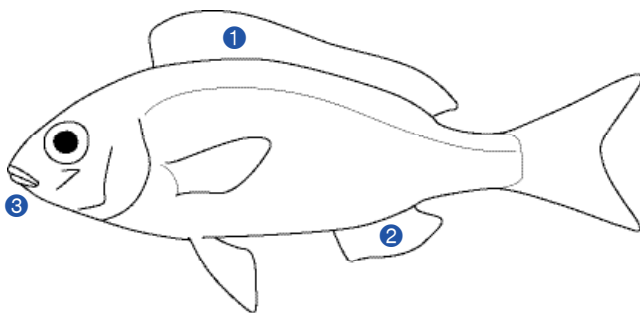
- ① no scales between eye and mouth
tanpa sisik antara mata dan mulut
- ② preopercle margin smooth
tepi depan tutup insang halus
- ③ axillary scale at base of pelvic fins
sisik aksila di pangkal sirip perut

74 – Family Lethrinidae (emperors, p. 212)



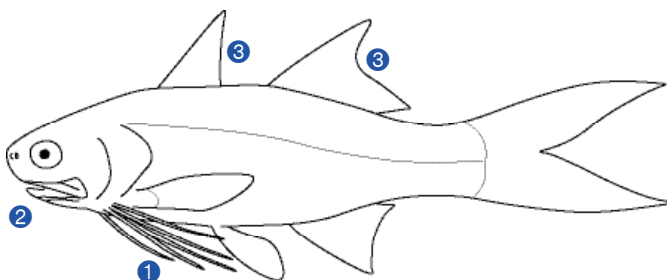
- ① no scales between eye and mouth
tidak ada sisik antara mata dan mulut
- ② lips soft and fleshy
bibir lunak dan berdaging
- ③ dorsal fin with 10 spines, 9–10 soft rays
sirip punggung dengan 10 duri, 9–10 jari lunak

75 – Family Nemipteridae (threadfin breams, p. 222)



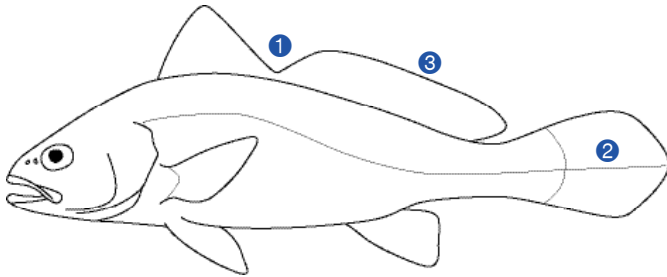
- ① dorsal fin with 9 soft rays
sirip punggung dengan 9 jari lunak
- ② anal fin with 7 soft rays
sirip dubur dengan 7 jari lunak
- ③ no chin pores
tanpa pori-pori pada dagu

76 – Family Polynemidae (threadfin salmon, p. 232)



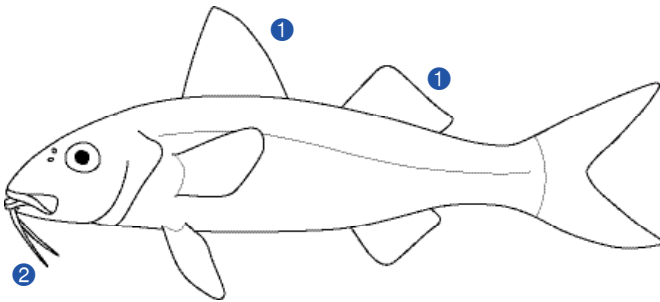
- ① lower pectoral-fin rays separate and filamentous
jari-jari sirip dada bagian bawah terpisah dan berfilamen
- ② mouth inferior
mulut di bawah
- ③ 2 separate dorsal fins
2 sirip punggung terpisah

77 – Family Sciaenidae (croakers, p. 234)



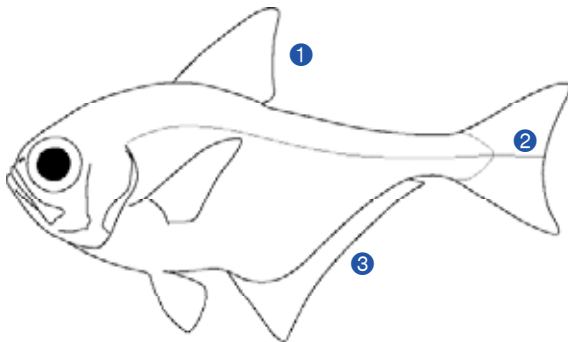
- ① 1 deeply notched dorsal fin
1 sirip punggung sangat berlekuk
- ② lateral line extending to tip of caudal fin
gurat sisi sampai ke ujung sirip ekor
- ③ dorsal fin with 21–44 soft rays
sirip punggung dengan 21–44 jari lunak

78 – Family Mullidae (goatfishes, p. 238)



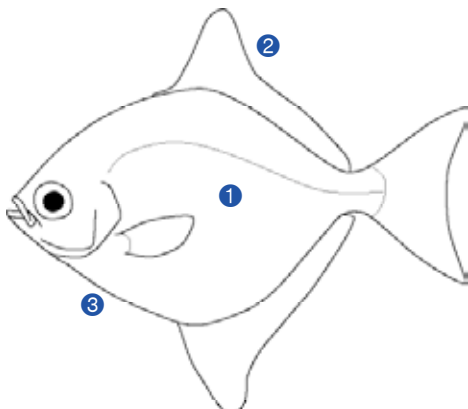
- ① 2 well-separated dorsal fins
2 sirip punggung terpisah sempurna
- ② pair of long chin barbels
sungut panjang berpasangan di dagu

79 – Family Pempheridae (bullseyes, p. 246)



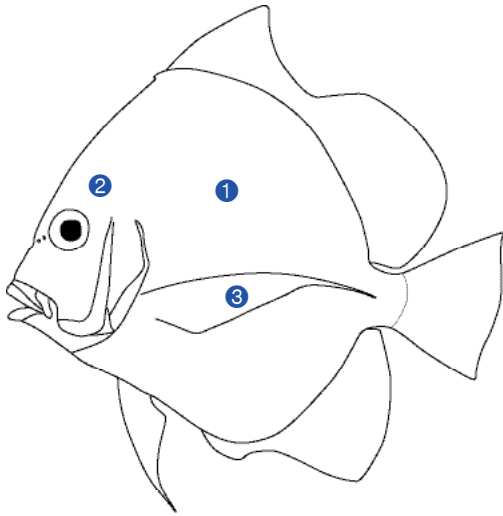
- ① 1 short dorsal fin
1 sirip punggung pendek
- ② lateral line extending to tip of caudal fin
gurat sisi sampai ke ujung sirip ekor
- ③ anal fin long
sirip dubur panjang

80 – Family Monodactylidae (diamondfishes, p. 248)



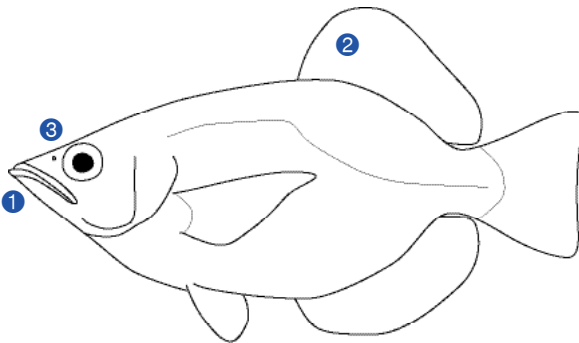
- ① body oval, very compressed
tubuh lonjong, sangat pipih
- ② 1 dorsal fin, anterior rays longest
sirip punggung tunggal, jari bagian depan terpanjang
- ③ pelvic fins absent
tidak ada sirip perut

81 – Family Drepaneidae (sicklefishes, p. 248).



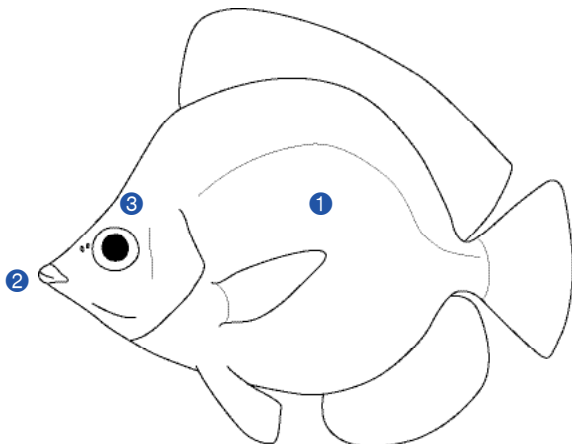
- ① body oval, strongly compressed
tubuh lonjong, teramat pipih
- ② head very short
kepala sangat pendek
- ③ pectoral fins long, reaching caudal peduncle
sirip dada panjang, mencapai pangkal ekor

82 – Family Toxotidae (archerfishes, p. 248)



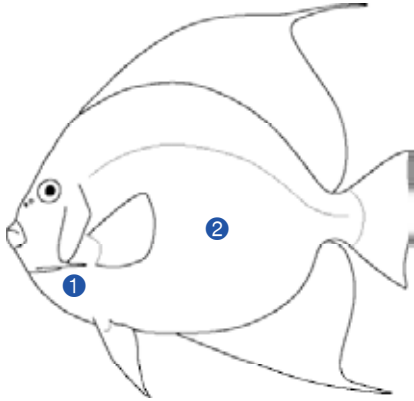
- ① lower jaw protruding
rahang bawah menonjol
- ② 1 dorsal fin with 4–6 stout dorsal spines
1 sirip punggung dengan 4–6 duri tebal di punggung
- ③ dorsal head flattened
bagian atas kepala rata

83 – Family Chaetodontidae (butterflyfishes, p. 248)



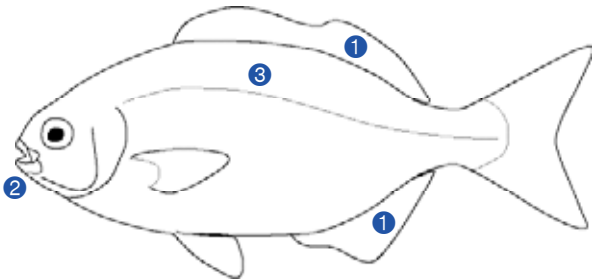
- ① body ovate, very compressed
tubuh bulat telur, sangat pipih
- ② mouth small, protrusible
mulut kecil, protrusible
- ③ eye band usually present
terdapat baris pada mata

84 – Family Pomacanthidae (angelfishes, p. 254)



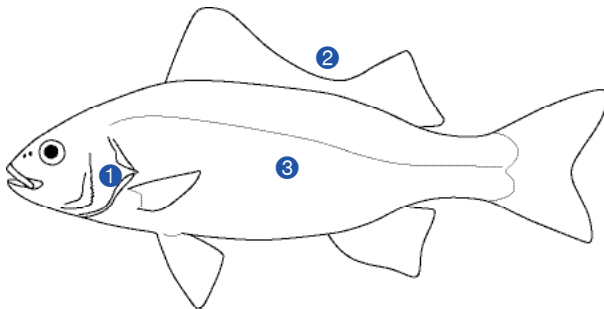
- ① 1 or more strong spines at preopercle angle
1 atau lebih duri kuat pada sudut depan tutup insang
- ② body ovate, compressed
tubuh bulat telur, pipih

85 – Family Kyphosidae (drummers, p. 258)



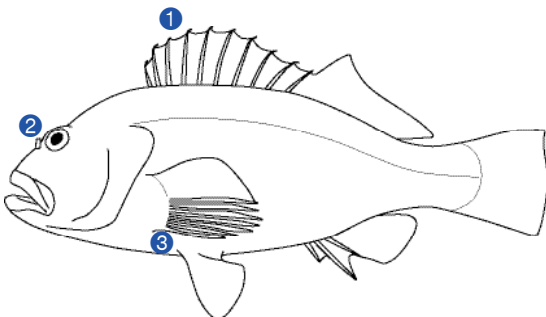
- ① soft portions of dorsal and anal fins mostly scaled
bagian lunak sirip punggung dan dubur umumnya bersisik
- ② teeth on both jaws incisor-like
gigi pada kedua rahang seperti gigi seri
- ③ 49–55 pored lateral-line scales
49–55 pori sisik gurat sisi

86 – Family Terapontidae (grunters, p. 258)



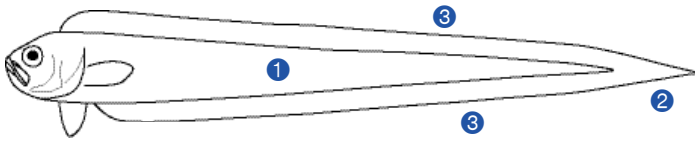
- ① opercle with 2 spines
tutup insang dengan 2 duri
- ② 1 notched dorsal fin
1 sirip punggung berlekuk
- ③ silvery, usually with darkish stripes on sides
keperakan, biasanya dengan garis gelap di sisi

87 – Family Cirrhitidae (hawkfishes, p. 260)



- ① cirri on tips of dorsal spines
cirri pada ujung duri punggung
- ② fringe of cirri on posterior nostril
pinggiran cirri pada lubang hidung belakang
- ③ lower 5–7 pectoral-fin rays enlarged, unbranched
5–7 jari sirip dada bagian bawah membesar, tidak bercabang

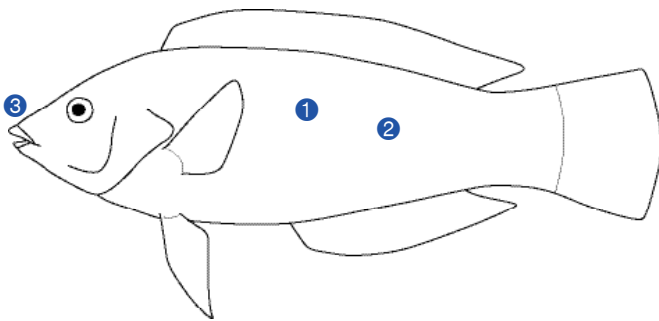
88 – Family Cepolidae (bandfishes, p. 260)



- ① body compressed, elongate, tapering
tubuh pipih, memanjang, menyempit
- ② caudal fin lanceolate
sirip ekor lancip
- ③ dorsal and anal fins very long
sirip punggung dan dubur sangat panjang

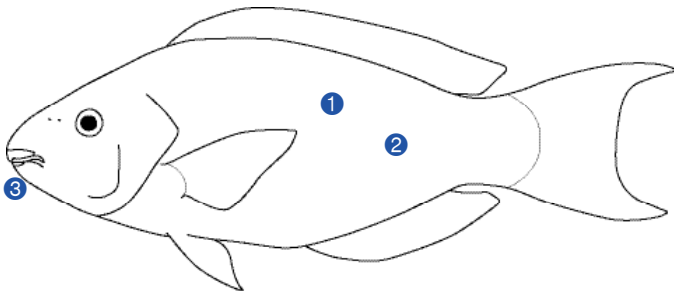
Order Perciformes: Labroidei

89 – Family Labridae (wrasses, p. 260)



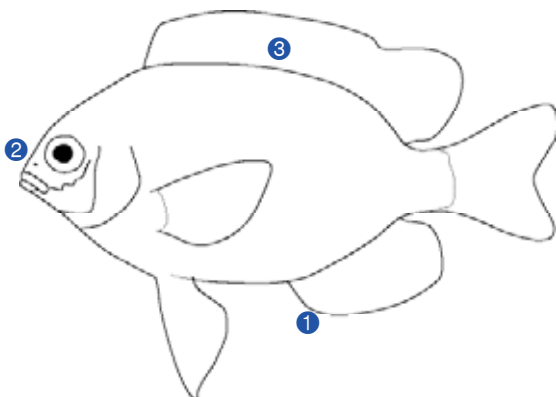
- ① most species brightly coloured
kebanyakan jenis berwarna terang
- ② scales usually large, cycloid (smooth)
sisik umumnya besar, melingkar (halus)
- ③ lips usually fleshy, teeth separate
biasanya bibir berdaging, gigi terpisah

90 – Family Scaridae (parrotfishes, p. 278)



- ① most species brightly coloured
kebanyakan jenis berwarna terang
- ② scales large, cycloid (smooth)
sisik besar, melingkar (halus)
- ③ teeth usually fused into beak-like plates
gigi biasanya menyatu menjadi lempeng menyerupai paruh

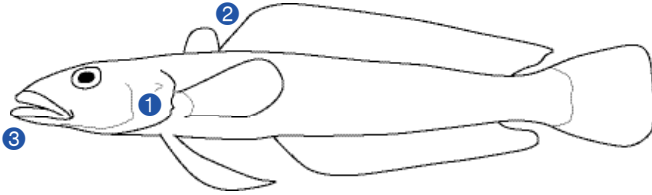
91 – Family Pomacentridae (damselfishes, p. 286)



- ① anal fin with 2 spines
sirip dubur dengan 2 duri
- ② 1 nostril on each side of snout
1 lubang hidung di setiap sisi moncong
- ③ 1 dorsal fin
1 sirip punggung

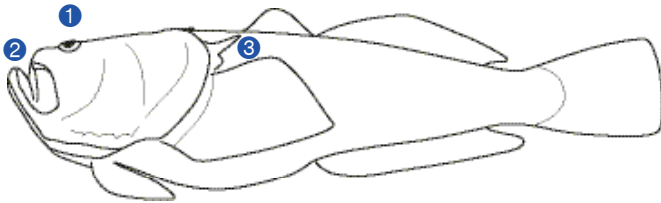
Order Perciformes: Trachinoidei

92 – Family Pinguipedidae (sandperches, p. 294)



- ① strong opercular spine
duri kuat pada tutup insang
- ② long dorsal fin with 4 or 5 spines,
20–24 soft rays
sirip punggung panjang dengan 4–5 duri,
20–24 jari lunak
- ③ lips fleshy
bibir berdaging

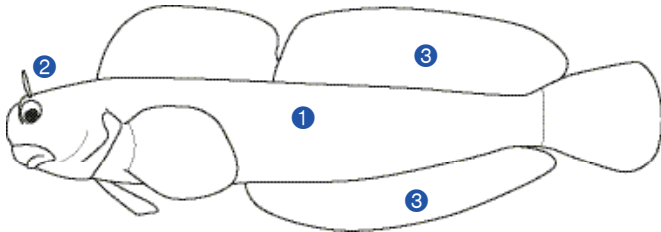
93 – Family Uranoscopidae (stargazers, p. 298)



- ① eyes on top of head
mata di atas kepala
- ② mouth large, nearly vertical
mulut besar, hampir vertikal
- ③ cleithral spine present
terdapat duri cleithral

Order Perciformes: Blennioidei

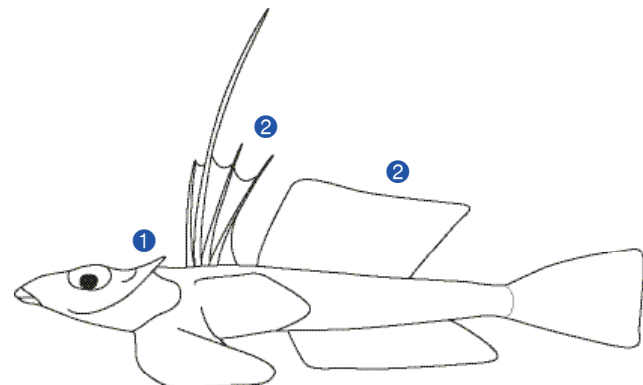
94 – Family Blenniidae (blennies, p. 294)



- ① no scales
tidak ada sisik
- ② head usually with cirri above eyes
kepala biasanya dengan cirri diatas mata
- ③ dorsal and anal fins long
sirip punggung dan dubur panjang

Order Perciformes: Callionymoidei

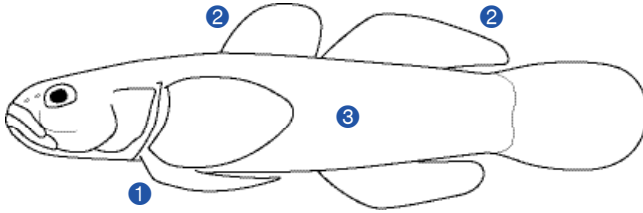
95 – Family Callionymidae (dragonets, p. 300)



- ① strong preopercular spine
duri kuat pada depan tutup insang
- ② 2 separate dorsal fins, 1st with 4 spines,
2nd with 12–14 rays
2 sirip punggung terpisah, yang ke-1
dengan 4 duri, yang ke-2 dengan 12–14
jari-jari

Order Perciformes: Gobioidei

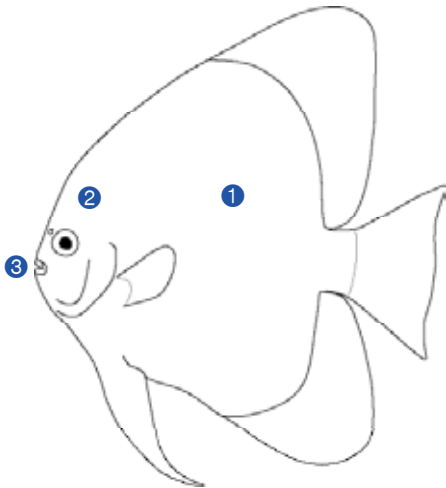
96 – Family Gobiidae (gobies, p. 300)



- ① pelvic fins united
sirip perut menyatu
- ② 2 separate dorsal fins
2 sirip punggung terpisah
- ③ scales present, large
terdapat sisik, besar

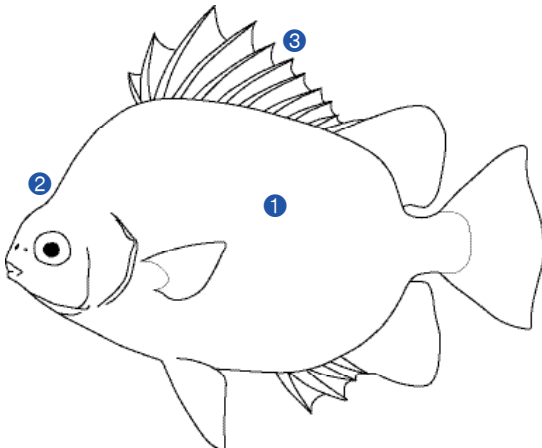
Order Perciformes: Acanthuroidei

97 – Family Ephippidae (batfishes, p. 304)



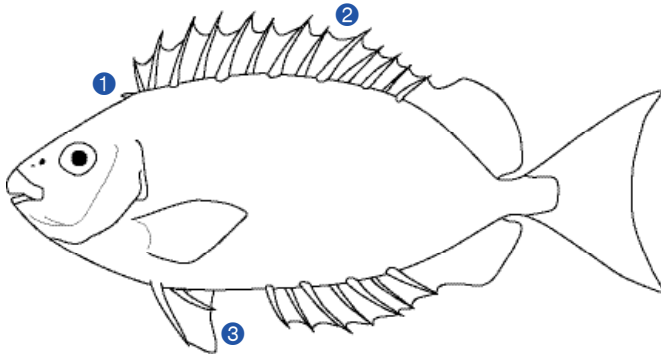
- ① body very deep, strongly compressed
tubuh sangat lebar, teramat pipih
- ② head very short
kepala sangat pendek
- ③ mouth small
mulut kecil

98 – Family Scatophagidae (scats, p. 306)



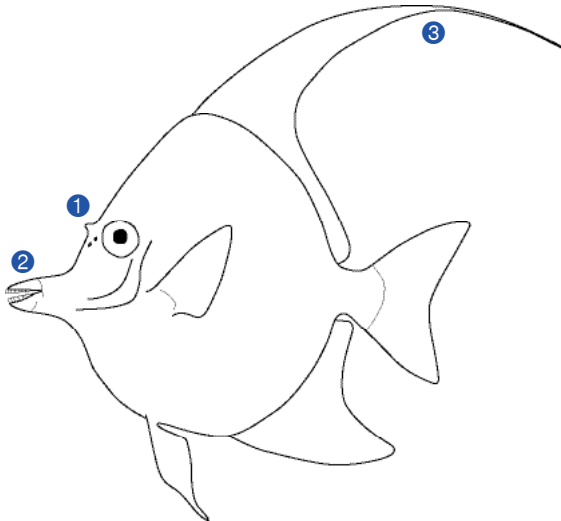
- ① body deep, strongly compressed
tubuh lebar, teramat pipih
- ② concave profile above head
cekung di atas kepala
- ③ dorsal fin with 11–12 strong spines
sirip punggung dengan 11–12 duri kuat

99 – Family Siganidae (rabbitfishes, p. 306)



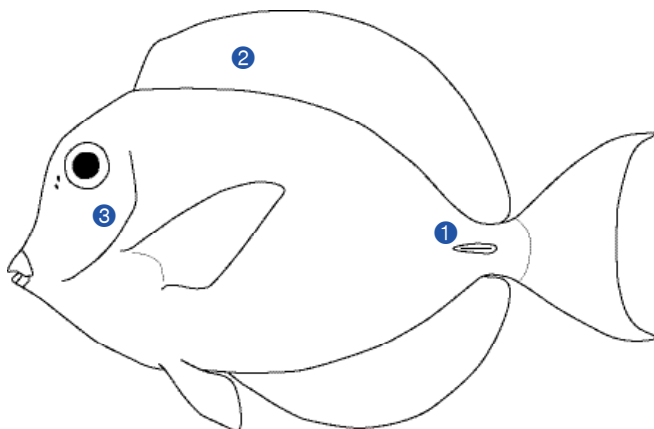
- ① dorsal fin preceded by sharp forward-pointing spine
sirip punggung didahului dengan duri tajam menghadap ke depan
- ② dorsal fin with 13 spines
sirip punggung dengan 13 duri
- ③ 2 spines in pelvic fin with 3 rays between 2 duri pada sirip perut dengan 3 jari diantaranya

100 – Family Zanclidae (Moorish Idol, p. 310)



- ① sharp bony projection in front of eye
tonjolan tajam bertulang di depan mata
- ② snout long, protruding
moncong panjang, menonjol
- ③ 3rd dorsal spine very long, filamentous
duri punggung ke 3 sangat panjang, berfilamen

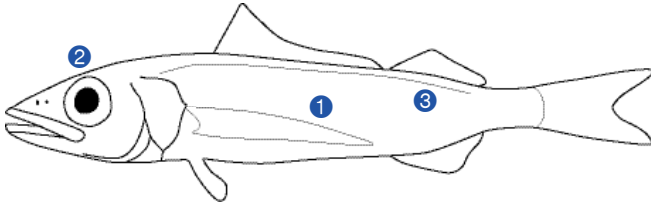
101 – Family Acanthuridae (surgeonfishes, p. 310)



- ① spine or bony plates on caudal peduncle
duri atau lempeng bertulang pada pangkal ekor
- ② single dorsal fin with 9–11 spines
sirip punggung tunggal dengan 9–11 duri
- ③ head very short
kepala sangat pendek

Order Perciformes: Scombrobracoidei

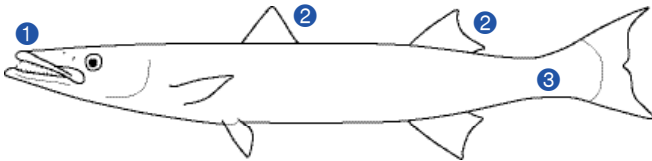
102 – Family Scombrobracidae (Longfin Escolar, p. 320)



- ① pectoral fin very long, reaching to anal fin
sirip dada sangat panjang, mencapai sirip dubur
- ② eyes very large
mata sangat besar
- ③ 1 lateral line, ending before caudal peduncle
1 gurat sisi, berakhir sebelum pangkal ekor

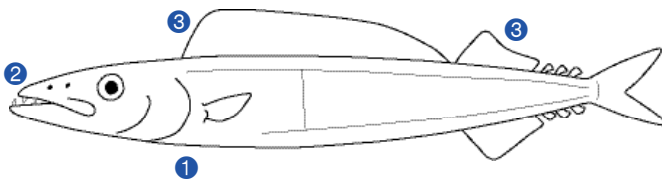
Order Perciformes: Scombroidei

103 – Family Sphyaenidae (barracudas, p. 320)



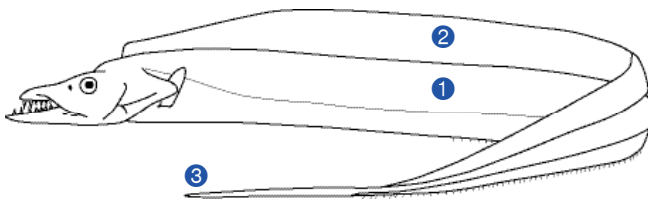
- ① large mouth with sharp teeth
mulut besar dengan gigi tajam
- ② 2 widely separated dorsal fins
2 sirip punggung terpisah lebar
- ③ no keels on caudal peduncle
tanpa lunas pada pangkal ekor

104 – Family Gempylidae (snake mackerels, p. 322)



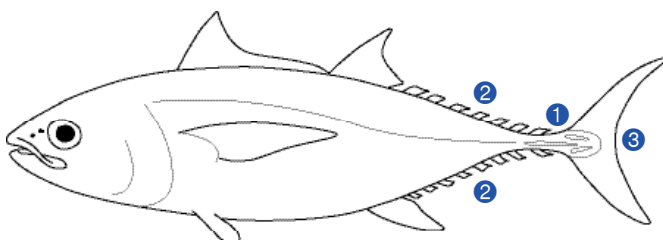
- ① pelvic fins small or absent
sirip perut kecil atau tidak ada
- ② strong teeth on both jaws
gigi kuat pada kedua rahang
- ③ 2 separate dorsal fins
2 sirip punggung terpisah

105 – Family Trichiuridae (cutlassfishes, p. 324)



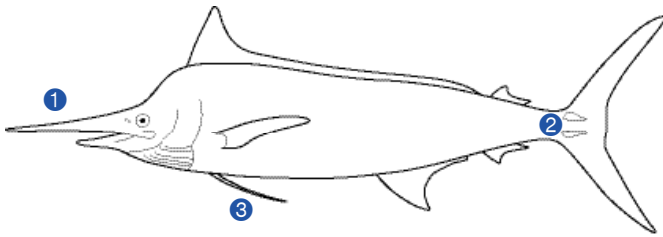
- ① body elongate, ribbon-like
tubuh memanjang, menyerupai pita
- ② 1 very long dorsal fin
1 sirip punggung sangat panjang
- ③ caudal fin very small or absent
sirip ekor sangat kecil atau tidak ada

106 – Family Scombridae (tunas, mackerels, p. 324)



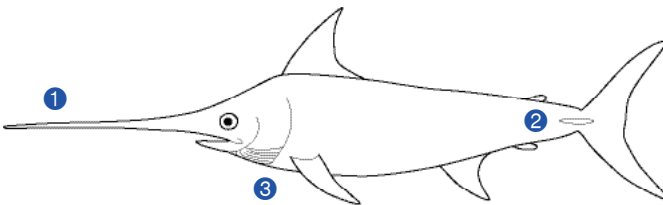
- ① 2 or 3 keels on caudal peduncle
2-3 lunas pada pangkal ekor
- ② finlets behind dorsal and anal fins
finlet di belakang sirip punggung dan sirip dubur
- ③ caudal fin deeply forked
sirip ekor sangat bercagak

107 – Family Istiophoridae (billfishes, p. 330)



- ① strong bill, round in cross-section
paruh kuat, potongan melintang bulat
- ② 2 keels on caudal peduncle
2 lunas pada pangkal ekor
- ③ pelvic fins elongate
sirip perut memanjang

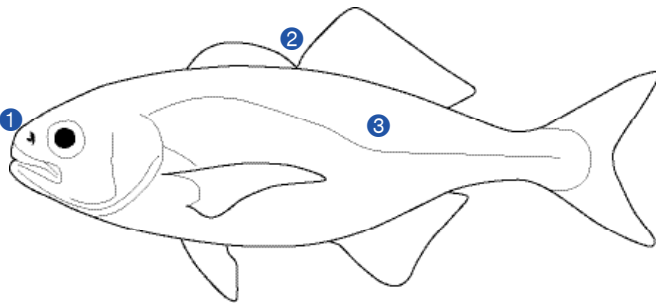
108 – Family Xiphiidae (Swordfish, p. 332)



- ① strong bill, flat in cross-section
paruh kuat, potongan melintang rata
- ② 1 large keel on caudal peduncle
1 lunas besar pada pangkal ekor
- ③ pelvic fins absent
tidak ada sirip perut

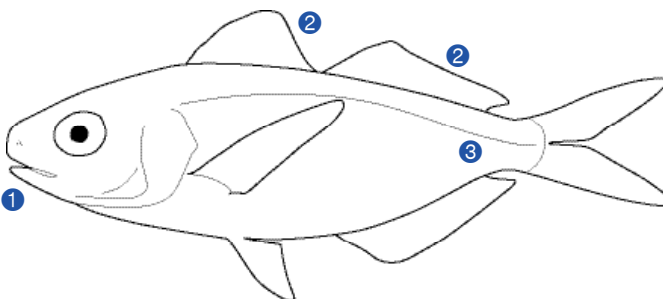
Order Perciformes: Stromateoidei

109 – Family Centrolophidae (trevallias, p. 332)



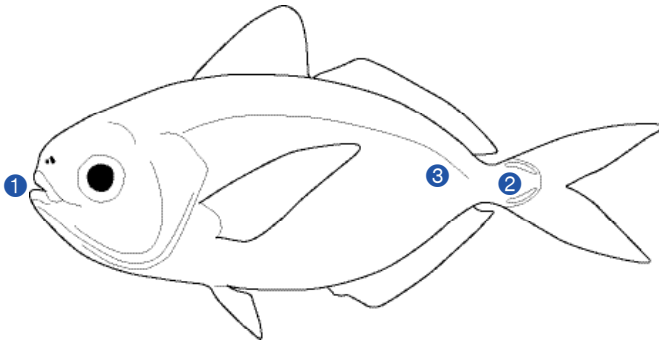
- ① no teeth on vomer or palatines
tanpa gigi pada vomer atau langit-langit
- ② 1 long dorsal fin
1 sirip punggung panjang
- ③ body blackish or brownish
tubuh kehitaman atau kecoklatan

110 – Family Nomeidae (driftfishes, p. 332)



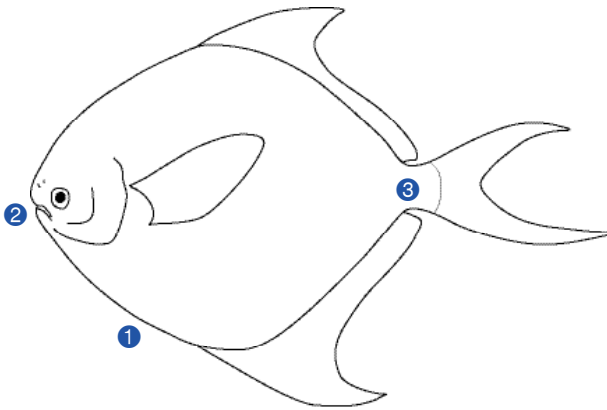
- ① teeth on vomer and palatines
gigi pada vomer atau langit-langit
- ② 2 separate dorsal fins
2 sirip punggung terpisah
- ③ lateral line extending onto caudal peduncle
gurat sisi sampai ke pangkal ekor

111 – Family Ariommatidae (ariommas, p. 336)



- ① no teeth on vomer or palatines
tanpa gigi pada vomer atau langit-langit
- ② 2 low lateral keels on caudal peduncle
2 lunas lateral rendah pada pangkal ekor
- ③ lateral line not extending onto caudal peduncle
gurat sisi tidak sampai ke pangkal ekor

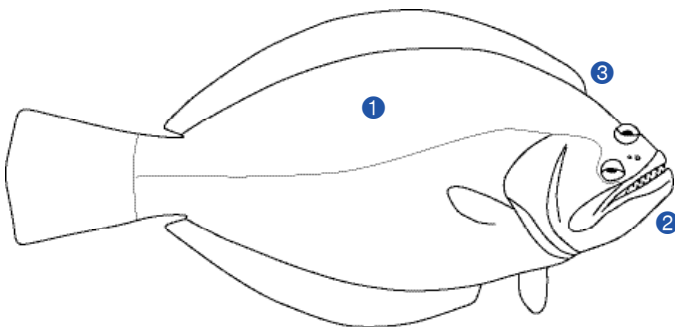
112 – Family Stromateidae (butterfishes, p. 336)



- ① no pelvic fins
tidak ada sirip perut
- ② mouth small
mulut kecil
- ③ no scutes on caudal peduncle
tanpa sisik tebal di pangkal ekor

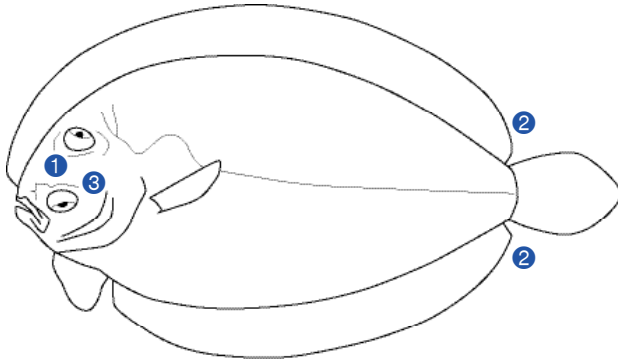
Order Pleuronectiformes

113 – Family Psettodidae (halibuts, p. 336)



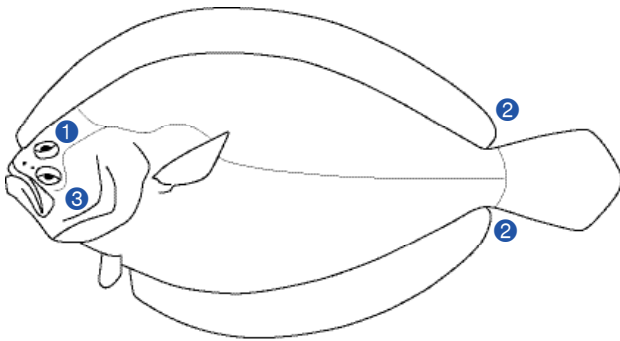
- ① flattened body shape
bentuk tubuh rata
- ② very large teeth in jaws
gigi rahang sangat besar
- ③ dorsal-fin origin posterior to eyes
pangkal sirip punggung di belakang mata

114 – Family Bothidae (lefteye flounders, p. 336)



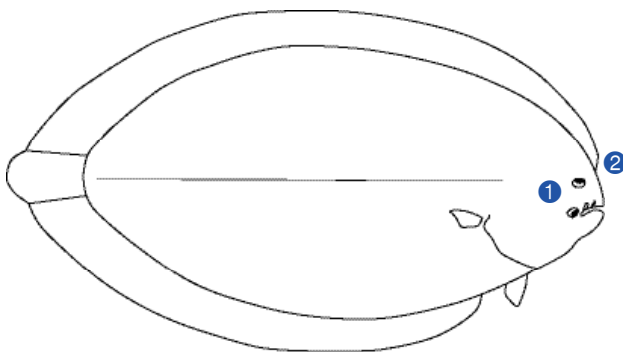
- ① eyes on left side of body
mata terletak pada sisi kiri tubuh
- ② dorsal and anal fins not joined to caudal fin
sirip punggung dan dubur tidak bersatu dengan sirip ekor
- ③ no lateral line present below eye
tanpa gurat sisi di bawah mata

115 – Family Paralichthyidae (sand flounders, p. 336)



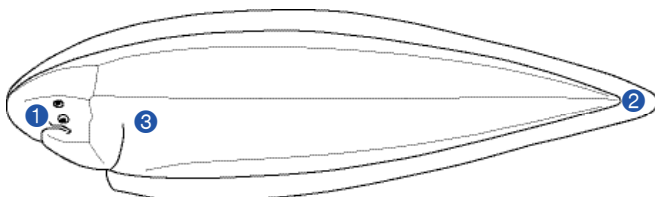
- ① eyes on left side of body
mata terletak pada sisi kiri tubuh
- ② dorsal and anal fins not joined to caudal fin
sirip punggung dan dubur tidak bersatu dengan sirip ekor
- ③ lateral line present below eye
terdapat gurat sisi di bawah mata

116 – Family Soleidae (soles, p. 340)



- ① eyes on right side of body
mata terletak pada sisi kanan tubuh
- ② dorsal-fin origin anterior to eyes
pangkal sirip punggung di bagian depan mata

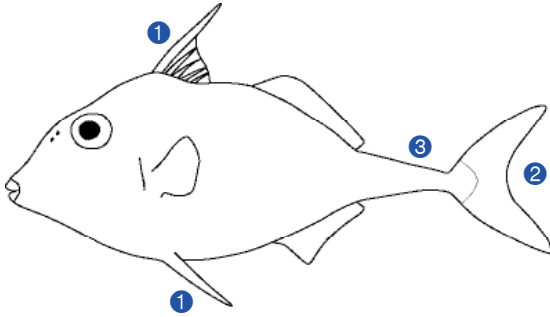
117 – Family Cynoglossidae (tonguesoles, p. 342)



- ① eyes on left side of body
mata terletak pada sisi kiri tubuh
- ② dorsal, anal and caudal fins united
sirip punggung, dubur dan ekor bersatu
- ③ pectoral fins absent
tidak ada sirip dada

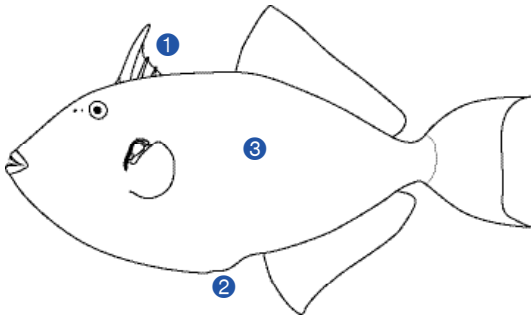
Order Tetraodontiformes

118 – Family Triacanthidae (tripodfishes, p. 344)



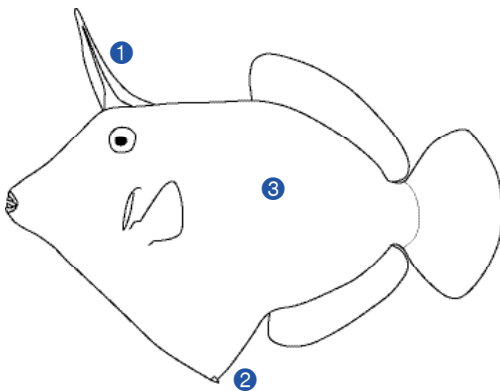
- ① 1st dorsal and pelvic spines very large, robust
1 duri punggung dan perut sangat besar, kokoh
- ② caudal fin strongly forked
sirip ekor amat bercagak
- ③ caudal peduncle narrow, tapering
pangkal ekor sempit, meruncing

119 – Family Balistidae (triggerfishes, p. 346)



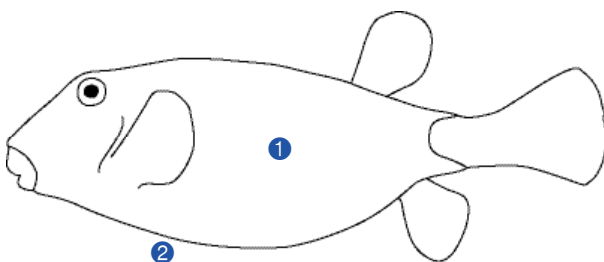
- ① 1st dorsal fin separate, with 3 strong spines
sirip punggung ke-1 terpisah, dengan 3 duri kuat
- ② pelvic fins reduced to 4 enlarged scales
sirip perut mengecil menjadi 4 sisik yang membesar
- ③ skin thick with plate-like scales
kulit tebal dengan sisik menyerupai lempeng

120 – Family Monacanthidae (leatherjackets, p. 352)



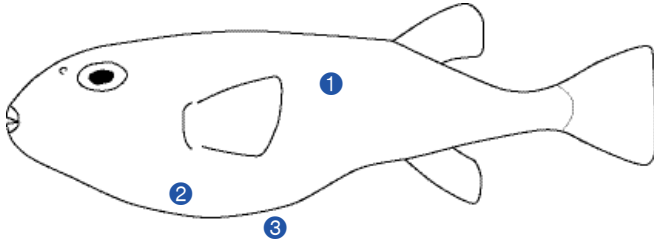
- ① 1st dorsal fin with 2 spines, 1st very strong
sirip punggung ke-1 dengan 2 duri, duri ke-1 sangat panjang
- ② pelvic fins reduced to a bony rudiment
sirip perut mengecil menjadi suatu tulang lancip
- ③ skin rough with minute, spinule-like scales
kulit kasar dengan sisik kecil menyerupai spinula

121 – Family Ostraciidae (boxfishes, p. 356)



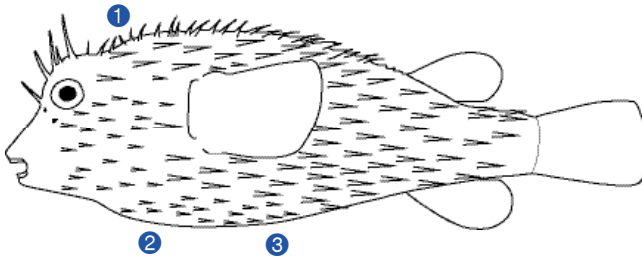
- ① body encased in a shell of thick scale plates
tubuh terbungkus dengan pelindung dari lempeng bersisik tebal
- ② no pelvic fins
tidak ada sirip perut

122 – Family Tetraodontidae (pufferfishes, p. 356)



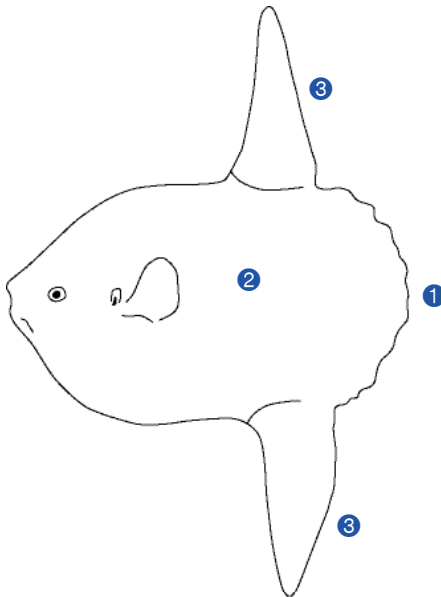
- ① no scales, often with spinules on body
tanpa sisik, sering terdapat spinula pada tubuh
- ② inflatable belly
perut dapat mengembang
- ③ no pelvic fins
tidak ada sirip perut

123 – Family Diodontidae (porcupinefishes, p. 358)



- ① large spines on head and body
duri besar pada kepala dan tubuh
- ② inflatable belly
perut dapat mengembang
- ③ no pelvic fins
tidak ada sirip perut

124 – Family Molidae (sunfishes, p. 360)



- ① caudal fin rudder-like
sirip ekor menyerupai kemudi
- ② body deep, compressed
tubuh lebar, pipih
- ③ dorsal and anal fins tall, triangular
sirip punggung dan dubur tinggi, berbentuk segitiga

