

# METHODS FOR COUNTS & MEASUREMENTS

## Counts of scales

Scales are often difficult to be count without staining and/or magnification. A practical method for temporary staining of body details with cyanine blue is featured by Saruwatari *et al.* (1997).

**Lateral-line scales** (yellow dots ● in right figure): number of scales with lateral-line canals/pores, except for those on the caudal fin. If the lateral line on the body is divided into two parts (*e.g.*, *Oreochromis* and some *Ambassis*), values of the anterior part (starting from the humeral areas) and posterior part (ending around the caudal fin base) are represented separately as "anterior part + posterior part" (*e.g.*, 12+20).

**Predorsal scales** (purple dots ● in right figure): number of scales on predorsal midline.

**Scales above lateral line** (red dots ● in right figure) / **scales below lateral line** (blue dots ● in right figure): number of scales in a oblique scale row on body above or below lateral line; not including the lateral-line scale.

**Scutes** (see figure on p.9): number of scutes along the ventral midline of preanal area; these appear only in the clupeid and engraulidid fishes amongst the Mekong fishes. Usually represented separately as "preventral (before pelvic-fin origin) + postventral (behind) scutes" (*e.g.*, 5+7)

**Circumpeduncular scales** (green dots ● in right figure): all scales on a zig-zag vertical scale row encircling the narrowest part of the caudal peduncle.

## Counts of fin rays and spines

Fin rays are usually counted separately into spines and rays (see characteristics of spine and ray on p.4). In the descriptive accounts, spines and rays are designated by capital Roman numerals (I, II...) and Arabic numerals (1, 2...), respectively; unbranched rays are sometimes designated by small Roman numerals (i, ii...). Notation of the number of fin rays are as shown in the right figures, and the other Notes are noted below:

**Dorsal- or anal-fin rays/spines** (abbr. D): last dorsal- or anal-fin ray is split down to the base in many cases, appearing as if it comprises two rays; if the last two rays appear to be in contact with each other at their bases, these rays are counted as a single ray (see right figures).

**Caudal-fin rays** (abbr. C): number of caudal-fin rays is usually not so varied amongst the closely-related taxa; it is useful for species identification of, *e.g.*, *Oryzias* and *Cynoglossus*.

**Pectoral-fin rays** (abbr. P<sub>1</sub>): number and/or branching pattern of pectoral-fin rays is sometimes useful for fish species identification. All rays are counted including minute and rudimental ones.

**Pelvic-fin rays/spines** (abbr. P<sub>2</sub>): number of pelvic-fin rays/spines is useful for many fish species identification. All rays/spines are counted, even if their bases are in contact with each other.

## Measurements

All measurements are taken in a straight line from point to point.

**Body depth** (abbr. BD): the greatest depth (vertical length) of body, unless otherwise noted. In some fish groups, it is measured at the pelvic-fin origin.

**Caudal-fin length** (abbr. CL): length of the longest caudal-fin ray.

**Caudal-peduncle depth** (abbr. CPD): the least depth of the caudal peduncle (measured vertically).

**Caudal-peduncle length** (abbr. CPL): length between the posteriormost point of the anal-fin base and the mid-lateral point of the caudal-fin base (= structural base of middle caudal-fin ray, easily confirmed when the fin is bent laterally in many fishes).

**Disc width** (abbr. DW): the greatest width of disc [applied only to rays (stingrays) in the Mekong fishes].

**Eye diameter** (abbr. ED): the greatest diameter of the eye.

**Head length** (abbr. HL): length between the snout tip and the posterior-most point of the gill cover (including membrane).

**Jaw length** (abbr. JL): length between the mid-anteriormost point and the posteriormost point of upper jaw or lip.

**Length of anal-fin base** (abbr. AB): length between the origin (anteriormost point of base of first ray/spine) and the end (posteriormost point of base of last ray) of the anal-fin base.

**Length of dorsal-fin base** (abbr. DB): length between the origin (anteriormost point of base of first ray/spine) and the end (posteriormost point of base of last ray) of the dorsal-fin base.

**Pectoral-fin length** (abbr. P<sub>1</sub> L): length between the base of first ray (= dorsalmost or anteriormost ray) and the distal tip of the longest ray of pectoral fin.

**Pelvic-fin length** (abbr. P<sub>2</sub> L): length between the base of first ray/spine (= dorsalmost or anteriormost ray/spine) and the distal tip of the longest ray of the pectoral fin.

**Preanal length** (abbr. Prea. L.): length between the snout tip and the origin (anteriormost point of base of first ray/spine) of the anal fin.

**Predorsal length** (abbr. Pred. L): length between the snout tip and the origin (anteriormost point of base of first ray/spine) of the dorsal fin.

**Prepelvic length** (abbr. Prev. L): length between the snout tip and the origin (anteriormost point of base of first ray/spine) of the pelvic fin.

**Snout length** (abbr. SnL): length between the snout tip and the anteriormost point of the eye.

**Standard length** (abbr. SL): length between the snout tip and the mid-lateral point of the caudal-fin base (= structural base of the middle caudal-fin rays, easily confirmed when the fin is bent laterally in many fishes).

**Total length** (abbr. TL): length between the mid-anteriormost point of the head (whether the lower jaw or the snout/upper jaw) and the distal tip of the caudal fin; if the caudal fin is emerginate or forked, dorsal and ventral lobes are squeezed together (towards the lateral midline) when the total length is measured.

