

BOX 1 | Glossary of key reproduction terms

Egg fertilization mechanisms: molecular processes in eggs involved in successful fertilization, including release of egg-derived chemicals, egg-sperm fusion, egg activation and polyspermy prevention

Egg receptivity: the length of time an egg is able to be fertilized by a sperm cell (Butts et al., 2012)

Exogenous vs. endogenous reproductive cues: external environmental cues vs. cues originating within the organism

F1: first filial generation comprised of offspring resulting from a cross between two individuals from parental generation.

Fecundity: number of mature eggs (or embryos in other papers) per unit body volume. For colonial organisms, the number of eggs and/or sperm per module (i.e. polyp), or the proportion of modules that are reproductive within the colony

Gamete quality: size, composition, and developmental stage of gametes

Gametogenesis: process by which gametes are produced through meiosis and cell differentiation. Formation of ova occurs through **oogenesis** and spermatozoa through **spermatogenesis**

Gonad condition: Assessment of gonad development via histological examination (Uthicke et al., 2014)

Gonad Index (GI) or Gonadosomatic Index (GSI): gonad mass as a proportion of the total body mass [(gonad weight /total tissue weight) X 100]

Gravid: carrying eggs or young

Hatching success: percentage of eggs which produce viable offspring

Hemocyte cell: phagocytic cells with a role in invertebrate immunity

Indeterminate vs. determinate sex: ability to change sex during an organism’s lifetime vs having a defined sex at birth

Mating behavior: social interaction that prepares for, or increases the success of, copulation and fertilization

Mass spawning: synchronous release of gametes by many species or the majority of a mating aggregation

Maximum fertilization: asymptotic maximum in fertilization success based on a typical bell-shaped fertilization curve (Albright and Mason, 2013)

Naupliar larvae: first planktonic stage of many crustacean larvae, characterized by a single eye

Neuropeptides: short sequences of amino acids coexpressed with neurotransmitters and are widely expressed throughout the central nervous system (Thiele, 2017)

Oogonia: female gametocyte that produces eggs

Oosoption (atresia): process of resorbing vitellogenic eggs under stress to reuse lipids for other physiological processes (Eckelbarger et al., 1984)

Phenology: study of periodic events in biological life cycles and how they are influenced by local, seasonal, and interannual environmental variation

Polyspermy: occurs when an egg is fertilized by more than one sperm

Reproductively inactive vs. sexually immature: sexually mature individual not presently breeding vs. one not old or big enough to undergo gametogenesis

Reproductive output: number of reproductive elements (spermary or egg) per unit body volume. Can also be measured by counting embryos per unit body volume. In colonial organisms, reproductive output is the total amount of gametes released by the colony. In some cases, fecundity and reproductive output are used interchangeably.

Resource allocation: proportion of an organism’s energy budget allocated to reproduction

Sex determination: initial event before sex differentiation that determines whether gonads will develop as male or female (Forconi et al. 2013)

Sex differentiation: events after sex determination that ultimately produce either the male or female sexual phenotype

Signaling cascade: series of chemical reactions that occur within a biological cell when initiated by a stimulus

Sire and dam: father and mother of a genetic line

Spawned bundle: sperm and/or egg clusters released to the water column for external fertilization

Sperm activity: sperm swimming behavior, including motility, velocity or speed, and path linearity

Sperm linearity: how straight the sperm is swimming, as calculated by the ratio of average velocity on a straight line from start to endpoint of the sperm’s path to the the curvilinear velocity along the sperm’s path (Eads et al., 2016a)

Sperm velocity: defined by (1) curvilinear velocity along the sperm’s path, (2) smoothed average sperm path velocity, (3) average velocity on a straight line from start to endpoint of the sperm’s path (Eads et al., 2016b)

Spermatocyte: male gametocyte from which spermatozoa develop

Standardized Gonad Index (SGI): reproductive cycle indicator based on the differences between the observed and expected weights of the gonads for an individual of a given size, takes into account allometric gonadal growth

Synchronization: coordination of reproductive events to increase mating potential, fertilization, and offspring success

Timing of reproduction: milestones that rely on environmental and chronological cues

Vitelli: the proteinous yolk found in an egg

Volitional vs. strip or induced spawning: release of gametes via natural or hormonal means vs artificially releasing gametes through anthropogenic means (Watanabe et al., 2003)