Supplementary document S1 – Definitions of applied character or its states

Animal – This term is related to the macro-habitat where eggs are laid, when eggs are kept in or moved on the body of one of the parents. Besides this, it is applied to offspring development with indirect or with parental feeding development on the body of one of the parents.

Aquatic – Related to eggs that are laid in the water.

Bamboo – Term applied to the microhabitat of the spawning, where eggs are laid inside the internodes of bamboo without water.

Burrow – Term applied to the microhabitat where eggs are laid. In this case, eggs are laid in a subterranean burrow, dug or not by parents.

Constructed nest – A structure prepared by the amphibian, which can be considered as any kind of environmental modification for the function of incubating eggs and raising their offspring.

Depression – Ground depression that can be dug by adult individuals. This is also termed basin in previous studies.

Direct development – Applied to offspring development without larval stage and is observed in amphibians where eggs hatch into juvenile morphs.

Endotrophic – This term is used in offspring nutrition, where the larvae obtain their entire developmental energy from vitellogenic yolk. This category is applied only to indirect developing amphibians.

Environment – Term applied to the microhabitat where eggs are laid. Eggs are laid in the environment, in or outside nests.

Exotrophic – This term is used in offspring nutrition, where the larvae obtain energy by oral consumption of food, after the yolk runs out. We applied this category only to indirect developing amphibians.

Floating – Eggs are laid on the water surface, in froth or non-froth nests.

Floating vegetation (FLV) – Term applied to the microhabitat where eggs are laid. In this case, eggs are laid on floating vegetation in constructed nests.

Froth – Related to nest type. There are three types of froth nests: Froth foam and froth bubble. Froth nests are a specialized feature for amphibians that could be considered constructed nests, but according Simon and Pacheco (2005), they are not. See below "Nest construction".

Froth bubble – A film or layers of eggs supported by few larger bubbles trapped by the undersurface of the mucus secreted by the female's oviduct and produced by jumping of female frogs in the middle of the spawning. Alternatively, both anuran parents expel bubbles from the nares under the jelly of eggs and the air bubbles become trapped in the jelly.

Froth foam – Foam nests are produced by amphibians. The eggs are embedded in many small bubbles, produced by limbs motion (beating) of parents on the mucus secreted by the female's oviduct, which is mixed with air.

Ground – Term applied to the microhabitat where eggs are laid. In this case, eggs are laid on the soil.

In/on animal – Related to eggs laying substrate. In this case, eggs are kept in different parts of the body of the parents. For example, eggs are kept in the oviduct of amphibians. In amphibians, the eggs may also be incubated in the dorsum and legs of adults.

Indirect development – Applied to offspring development with larval stage. It is observed in most of the amphibians, where eggs hatch into larvae (tadpoles in anurans).

Insect mound (IMO) – Term applied to microhabitat where eggs are laid. It can be made by termites or ants.

Internal – Applied to offspring development. This is only applied to indirect or with parental feeding viviparous animals. In amphibians eggs hatch inside the parents into tadpoles and complete their development as froglets inside the male's hip pouch, eggs are swallowed and hatch into tadpoles and complete the development as froglets inside the mother's stomach, or eggs are hatched as tadpoles that develop inside the male's vocal sacs.

Lecithotrophic – This term is used for offspring nutrition. The embryos obtain energy from the vitellogenic yolk, as amphibians with direct development.

Lentic water – This term is used in relationship to eggs surrounding medium. Larvae develop in still/lentic water, such as lakes, ponds or swamps. The term is also related to offspring development, when larvae develop in still/lentic water, such as lakes, ponds or swamps, including fossorial larvae that develop under the sand bed, gravel bed, or mud. Water filled container (below) also contain lentic water.

Lotic water – This term is used in relationship to eggs surrounding medium. Eggs are laid in flowing waters, such as rivulets, creeks, streams or rivers, as reported for many amphibians. The term is also related to offspring development. Larvae that develop in flowing waters, such as rivulets, streams or rivers, as in amphibians, including larvae that are developed under the sand bed, gravel bed, or mud.

Marsupium – Marsupium is applied for marsupial frogs (Hemiphractidae), and refers to a body pouch where eggs, tadpoles, froglets or developing offspring.

Matrotrophic – Related to offspring nutrition. Embryos or nestlings obtain energy not only by vitellogenic yolk but supplemented by nourishment derived from the mother. This category is applied to direct developing amphibians.

Nest – Adapted from Simon and Pacheco (2005), nest is any delimited place selected by the parent (or both parents) for laying its eggs, regardless of how much (if any) digging, cleaning, lining, or building it requires.

Nest absent – When there is no nest used during egg or embryo development stages.

Non-aquatic – Related to egg laying substrate. Eggs are laid out of the water, as on the ground, rocks, trees, scrubs, or grass.

Non-froth nest – Eggs are laid in non-frothy nests, without the production of foam or bubbles.

Not constructed nest – Delimited nest not constructed by amphibians.

Not oviduct – This term is related to eggs surrounding medium. Eggs are embedded in dorsum or dorsal pouches of amphibians.

Offspring development – For amphibians the terms direct and indirect development are recognizable discrete categories, referring to the absence or presence of larval stage, respectively.

Oviduct/uterus – This term is related to eggs surrounding medium. Eggs develop in a specialized portion of the oviduct, being nourished by yolk, by tissue of the oviduct, or other substances secreted by the parent.

Oviparity – Embryos in the oviduct provided with yolk. After egg laying, the embryonic development continues outside the female body, within complex extraembryonic membranes (egg) that may include gelatinous capsules.

Patrotrophic – This term is used in offspring nutrition. Embryos or nestlings obtain energy not only by vitellogenic yolk, but also through paternal provision of nutrients.

Plant branch – Term applied to the microhabitat where eggs were laid. In this case, eggs are laid on sticks, branches, or trunks of trees and shrubs.

Plant leaf – Term applied to the microhabitat where eggs were laid. In this case, eggs are laid on or underneath leaves of trees, shrubs, and grass, either rolled (constructed nest) or not.

Plant root – Term applied to the microhabitat where eggs were laid. In this case, eggs are laid on or between tree roots.

Rock – Term applied to the microhabitat where eggs were laid. In this case, eggs are laid on or underneath rocks.

Subaquatic chamber (SCH) – Term applied to the microhabitat where eggs were laid. In this case, eggs are laid in a chamber inside the water.

Subaquatic ground (SGD) – Term applied to the microhabitat where eggs were laid. In this case, eggs are laid on the bed of lentic or lotic water bodies.

Subaquatic plant branch or root (SPBR) – Term applied to the microhabitat where eggs were laid. In this case, eggs are laid on or attached to subaquatic plant branches or roots.

Terrestrial – This term is related to eggs surrounding medium. Eggs are laid on terrestrial environment. It can also be related to offspring development. Offspring develop on terrestrial environment.

Tree hole – Term applied to the microhabitat where eggs were laid. In this case, eggs are laid in natural or constructed cavities in trees or logs.

Viviparity – Occurs when egg laying is absent (= oviparity).

Wall – Term applied to the microhabitat where eggs were laid. In this case, eggs are laid on rocky cliffs and ravines.

Water-filled reservoir (WFR) – Term applied to the microhabitat where eggs were laid. WFR are phytotelmata, holes in branches, trunks and logs, including bamboo internodes, and also includes empty snail shells (Gastropoda) containing water.

Without parental feeding (W/oPF) – In this case, the young do not depend on its parents or other adults for feeding.

With parental feeding (W/PF) – Applied to those species in which the young relies on their parents for feeding.

Supplementary document S2 – Description of reproductive modes of amphibians

1) Oviparity

1.1.) Anamniotic egg

1.1.1) Eggs in environment

Mode 1 – Nest absent, non-froth floating eggs laid in lentic water. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 2 – Nest absent, non-froth subaquatic eggs laid on bed of lentic water. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 3 – Nest absent, non-froth subaquatic eggs laid on plants, branches, or roots in lentic water. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known for anurans and salamanders.

Mode 4 – Non-froth eggs laid in water-filled container. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 5 – Non-froth eggs laid in water-filled container. Offspring with indirect development, lecithotrophic nutrition, endotrophic, with non-milk parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 6 – Non-froth eggs laid in water-filled container. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 7 – Non-froth eggs laid in water-filled container. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 8 – Non-froth eggs laid in depression. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 9 – Non-froth eggs laid in depression. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 10 –Non-froth eggs laid in constructed burrow. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 11 – Non-froth eggs laid in constructed depression. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans and salamanders.

Mode 12 – Non-froth eggs laid in constructed depression. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known for anurans and salamanders.

Mode 13 – Nest absent, non-froth floating eggs laid in lotic water. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 14 – Non-froth eggs laid in subaquatic chamber in lotic water. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 15 – Nest absent, non-froth subaquatic eggs laid on bed of lotic water. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding, and larvae develop in/on parents. Known only for anurans.

Mode 16 – Nest absent, non-froth subaquatic eggs laid on bed of lotic water. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for amphibians.

Mode 17 – Non-froth eggs laid on rock nest in lotic water. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known for anurans and salamanders.

Mode 18 – Non-froth eggs laid in constructed subaquatic chamber nest in lotic water. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known for anurans and salamanders.

Mode 19 – Terrestrial non-froth eggs laid in plant root. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 20 – Terrestrial non-froth eggs laid on plant leaf. Offspring with direct development, lecithotrophic nutrition, exotrophic, and without parental feeding. Known for anurans and salamanders.

Mode 21 – Terrestrial non-froth eggs laid on plant leaf. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding, and larvae with terrestrial development. Known only for anurans.

Mode 22 – Terrestrial non-froth eggs laid on plant leaf. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 23 – Terrestrial non-froth eggs laid on plant leaf. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 24 – Terrestrial non-froth eggs laid in bamboo. Offspring with direct development, lecithotrophic nutrition, exotrophic, and without parental feeding. Known only for anurans.

Mode 25 – Terrestrial non-froth eggs laid in water-filled container. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding and larvae develop in lentic water. Known only for anurans.

Mode 26 – Terrestrial non-froth eggs laid in water-filled container. Offspring with indirect development, lecithotrophic nutrition, exotrophic, with non-milk parental feeding and larvae develop in lentic water. Known only for anurans.

Mode 27 – Nest absent, terrestrial non-froth eggs laid on ground. Offspring with direct development, lecithotrophic nutrition, exotrophic and without parental feeding. Known only for amphibians.

Mode 28 – Nest absent, terrestrial non-froth eggs laid on ground. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding, and terrestrial development. Known only for anurans.

Mode 29 – Nest absent, terrestrial non-froth eggs laid on ground. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding, and larvae develop in lotic water. Known only for amphibians.

Mode 30 – Nest absent, terrestrial non-froth eggs laid on ground. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding, and larvae develop in/on parents. Known for anurans and salamanders.

Mode 31 – Nest absent, terrestrial non-froth eggs laid on ground. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and terrestrial development larvae. Known for anurans and salamanders.

Mode 32 – Nest absent, terrestrial non-froth eggs laid on ground. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 33 – Nest absent, terrestrial non-froth eggs laid on ground. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 34 – Nest absent, terrestrial non-froth eggs laid on ground. Offspring with indirect development, lecithotrophic nutrition, exotrophic, with non-milk parental feeding, and larvae develop in/on parents. Known only for anurans.

Mode 35 – Terrestrial non-froth eggs laid on rock. Offspring with direct development, lecithotrophic nutrition, exotrophic, and without parental feeding. Known only for salamanders.

Mode 36 – Terrestrial non-froth eggs laid in constructed plant leaf. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding and larvae develop in lotic water. Known only for anurans.

Mode 37 – Terrestrial non-froth eggs laid in constructed plant leaf. Offspring with indirect development, matrotrophic nutrition, exotrophic, with parental feeding and larvae develop in lentic water. Known only for anurans.

Mode 38 – Terrestrial non-froth eggs laid in constructed burrow. Offspring with direct development, lecithotrophic nutrition, exotrophic, with parental feeding and terrestrial development larvae. Known only for caecilians.

Mode 39 – Terrestrial non-froth eggs laid in constructed burrow. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding and larvae develop in lotic water. Known only for anurans.

Mode 40 – Terrestrial non-froth eggs laid in constructed burrow. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding and larvae develop in lentic water. Known only for anurans.

Mode 41 – Terrestrial non-froth eggs laid in constructed burrow. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding and terrestrial development larvae. Known only for anurans.

Mode 42 – Terrestrial non-froth eggs laid in constructed burrow. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding and larvae develop in lotic water. Known only for anurans and caecilians.

Mode 43 – Terrestrial non-froth eggs laid in constructed burrow. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding and terrestrial development larvae. Known only for anurans.

Mode 44 – Nest absent, froth floating eggs laid in lentic water. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 45 – Nest absent, froth floating eggs laid in lentic water. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 46 – Froth eggs laid in water-filled container. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 47 – Froth eggs laid in depression. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 48 – Froth eggs laid in depression. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 49 – Froth eggs laid in depression. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 50 – Froth eggs laid in constructed depression. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 51 – Terrestrial froth eggs laid on plant leaf. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 52 – Terrestrial froth eggs laid on plant leaf. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 53 – Terrestrial froth eggs laid on plant leaf. Offspring with indirect development, lecithotrophic nutrition, exotrophic, with non-milk parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 54 – Terrestrial froth eggs laid on plant branch. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 55 – Terrestrial froth eggs laid on plant branch. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 56 – Terrestrial froth eggs laid in water-filled container. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 57 – Terrestrial froth eggs laid in burrow. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 58 – Nest absent, terrestrial froth eggs laid on ground. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 59 – Nest absent, terrestrial froth eggs laid on ground. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 60 – Terrestrial froth eggs laid in insect mound. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 61 – Terrestrial froth eggs laid in constructed plant leaf. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 62 – Terrestrial froth eggs laid in constructed burrow. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 63 – Terrestrial froth eggs laid in constructed burrow. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 64 – Terrestrial froth eggs laid in constructed burrow. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 65 – Nest absent, froth bubble floating eggs laid in lentic water. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

1) Oviparity

1.1.) Anamniotic egg (Amphibia)

1.1.2) Eggs kept in/on animal

Mode 66 – Terrestrial non-froth eggs, nest absent. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lotic water. Known only for anurans.

Mode 67 – Terrestrial non-froth eggs, nest absent. Offspring with indirect development, lecithotrophic nutrition, exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 68 – Terrestrial non-froth eggs, nest absent. Offspring with indirect development, lecithotrophic nutrition, endotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 69 – Terrestrial non-froth eggs, nest absent. Offspring with direct development, lecithotrophic nutrition, exotrophic, and without parental feeding. Known only for anurans.

Mode 70 – Non-froth eggs kept in/on the animal, nest absent. Offspring with indirect development, matrotrophic nutrition (besides lecithotrophic), exotrophic, without parental feeding, and larvae develop in lentic water. Known only for anurans.

Mode 71 – Non-froth eggs kept in/on the animal, nest absent. Offspring with direct development, matrotrophic nutrition (besides lecithotrophic, may include oophagy and adelphophagy), exotrophic, and without parental feeding. Known only for anurans.

2) Viviparity

Mode 72 – Offspring with indirect development, matrotrophic nutrition, endotrophic, with parental feeding, and internal development. Known for anurans and caudatans.

Mode 73 – Offspring with direct development, matrotrophic nutrition, endotrophic, and without parental feeding. Known for caudatans and caecilians.

Mode 74 – Offspring with direct development, matrotrophic nutrition, exotrophic, and without parental feeding. Known for caudatans and caecilians.

Supplementary document S3 - References for Table S1

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