

Limnodynastes ornatus

Liana Joseph, 1999 © 2001 James Cook University

Authority: Gray, 1842

Common Name: Ornate Burrowing Frog

Description (Barker *et al.* 1995; Ehmann 1993; Tyler 1992; Watson and Martin 1973; Cogger 1994): A medium sized (males: 29-37mm, females: 35-42mm), rotund frog with slim forelimbs and short and stout hindlimbs. No webbing is found on the fingers and only slightly on the toes. A very large shovel shaped metatarsal tubercle is present. The tympanum is indistinct and there are vomerine teeth to the rear of the choanae. The skin is mostly smooth with small warts, often tipped in red, scattered over the dorsum with a series of low skin folds of variable length arranged longitudinally. The variation of colour and pattern of the dorsum is enormous. From very dark to pale grey or brown above. A distinct light hour glass pattern or U-shaped patch starting between the eyes, and/or a yellow or orange vertebral stripe may be present. There are usually dark temporal bands and several dark bars on the upper lip. Limbs are pale grey, barred or spotted. The dorsal surface of the male may be covered in tiny black stipules during the breeding season. Nuptial pads are very obvious on the second and third fingers of breeding males. The call is a short nasal "unk". The larvae of *L. ornatus* are pale brown with a maximum length of about 35mm. The body form is typical, it has small, unbranched external gills. The anus is median. There are 7 upper and 3 lower rows of labial teeth ($3^1_3/1^1_2^1$). The labial papillae surround the mouth disc except for the anterior margin.

Similar species (Cogger 1994; Ehmann 1993; Tyler 1977): *L. ornatus* is very similar to the closely related *L. spenceri*. The two are almost indistinguishable except the toes of *L. spenceri* are about $\frac{1}{2}$ webbed, compared to the $\frac{1}{4}$ webbing of *L. ornatus*. *L. spenceri* is a little larger and is lacking the proximal tubercle on the fourth toe. The call of *L. spenceri* is an obviously different, rapid "Ho-ho-ho-ho-ho" ("o"soft). As *L. spenceri* is restricted to the arid areas of central and western Australia, the distributions do not overlap.

Range (Cogger 1994): The range extends from the northern half of New South Wales (coast to far west) through the eastern half of Queensland, to the most northern parts of the Northern Territory and Western Australia.

Ecology and behaviour (Barker *et al.* 1995; Ehmann 1993; Cogger 1994; Emerson 1976; Frith and Frith 1976; Johnson 1969; Sander and Davis 1984; Tyler 1992): *L. ornatus* is one of the most frequently encountered frogs of its range, with a density of more than 1 million/km². It inhabits a diverse range of habitats including cool temperate to tropical grasslands, open forest and coastal rain and wet sclerophyll forest. It is often found in dry sandy watercourses far from permanent water. The ability to burrow enables this species, which has highly permeable skin, to withstand long, harsh periods of aridity, typical of its drier habitats. It spends the dry season in a dormant state well below the surface and resurfaces after heavy rains to quickly commence breeding. The behaviour of backward sliding burrowing involves using the hind feet to scrape the soil from underneath it and push itself into the hole rear end first. The body of *L. ornatus* is well suited to backward sliding burrowing. It has enlarged metatarsal tubercles on the plantar surface of the foot that acts as a shovel to scoop the soil. The short hind limbs increase the frogs digging ability by increasing the force generated by the metatarsal tubercle during scooping. The diet may reflect its fossorial habit, and termites and ants are the principal diet of similar frogs, cannibalism has been recorded.

Breeding biology (Barker *et al.* 1995; Ehmann 1993; Frith and Frith 1991; Tyler 1985; Tyler and Davies 1979; Watson and Martin 1973; White 1990): The calling and breeding season of *L. ornatus* is highly variable between years, although it is tied to the wet season as breeding only occurs after heavy rains. The males pick a permanent site in a water body, sometimes only as large as a puddle, often under overhanging vegetation. While spread-eagled in the water, he inflates his body and releases a short, sharp “unk” repeatedly. After a female has chosen the male, he grasps her around the groin (pelvic clasping) and the female paddles to produce a stream of bubbles forming the foaming egg mass. The female paddles in an alternating sequence, one hand is extended to in front of the head and moved downwards throwing the bubbles backwards and then the other hand performs the same movement. The bubbles are caught up with the eggs and jelly (mucopolysaccharides) derived from the oviduct and dispersing between the legs of the male. The first two fingers are flanged which may facilitate bubble production. The paddling involves 4-5 strokes that take 2-3 seconds and then a rest for a similar period. The male squeezes the female while she is resting and relaxes again when she resumes paddling. This intermittent pausing prevents the pair from surging forward away from the spawn clump. The female releases a single short note, a release call, to signal that she has exhausted her egg supply. The product of this amplexus is a frothy, often sticky spawn mass that is often attached to emergent plants. The foam mass of *L.ornatus* breaks down within 24 hours due to the high temperature of the tropical waters (Tyler 1985). From 150-1630 pigmented eggs of about 1.7 mm are laid. The larvae develop into frogs over as little as 21 days. Little has been recorded about the behaviour of tadpoles except that they aggregate when threatened with desiccation in the laboratory (Johnson 1969). A small amount of parental care has been postulated for some species of *Limnodynastes*. The males remain at the egg-laying site for many days after laying. It is questionable whether this is active care or as the calling site is the same as the laying site the male is advantaged by not having to recontest for a site later in the breeding season.

Taxonomy (Barker *et al.* 1995; Cogger 1994; Moore 1961, in Morescalchi and Ingram 1978; Tyler 1992): There has been continued confusion about which family to place the Australian myobatrachids into, Myobatrachidae or the closely related South American Leptodactylidae. At present there is much usage of both family names. Aside from this there is much debate the relationship of *L.ornatus* and *L.spenceri*. Some say the two are mere subspecies (Moore 1961) although the majority accepts them as independent species (Cogger 1994; Tyler 1992)

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