

Nyctimystes dayi

Nilla Scrivener, 1999 © 2001 James Cook University

Authority: Gunther, 1897

Common Names: Lace-eyed Tree Frog, Australian Lace-lid, Day's Frog, Day's Night-Mystery

Description (McDonald 1990; Czechura *et al.* 1987; Cogger 1992; Hero 1994; Barker *et al.* 1995; Tyler and Davies 1993): Distinguished from all other frog species in Australia by the presence of reticulum or palpebral venation on the lower eyelid, evident as fine gold or thick pearly veins. Eye prominent with dark brown iris, pupil vertically elliptical. *Canthus rostralis* commonly straight and distinct though may be curved in females. Dermal flap on heel prominent or if absent replaced by 2-3 low tubercles present also along posterior margin of tarsus. Feet extensively webbed, hands moderately so, toe discs usually smaller than finger discs. Snout is acuminate to rounded, short and flattened. Adult body length: females 45-55mm, males considerably smaller at 30-42mm. Ventral surface of skin and flanks is coarsely granular, dorsal skin surface is smooth or finely granular. Tympanum is obscured by a covering of skin or is indistinct, whereas the tympanic annulus is usually prominent. Colouration and pattern is highly variable, ranging from rich tawny brown or orange-brown, often with cream rosette-like spots distributed irregularly over the back, limbs and head, to cream, white or yellowish with black/grey throat sides and undersides of thigh. Populations may show clinal variation with dark brown forms in the south to grey or creamish in the north. Another distinguishing feature is the slight scalloping or folding along posterior margin of forearm and tarsus. Call is a harsh growl-like sound. Breeding males chorus 3 to 4 times in succession a drawn out "eeeeee" that carries a downward inflection. Single males call a short, sharp "ee" repeated every 5-6 seconds, occasionally repeated over long durations.

Similar species (Barker *et al.* 1995): *Litoria eucnemis* and *L.genimaculata* are similar to *N.dayi*, but can be distinguished by having a more defined marginal skin fold, no reticulum on the lower eyelid and a horizontal pupil.

Range (McDonald 1990; Ingram and McDonald 1993): Paluma (19°01'S, 146°13'E) to Home Rule (15°44'S, 145°18'E) at elevations 0-1200m, though observations suggest they have become restricted to elevations 0-300m.

Ecology and behaviour (Zug 1993; Cogger 1992; Barker *et al.* 1995; Czechura *et al.* 1987; Tyler 1992; Tyler and Davies 1993): *N.dayi* is an arboreal species confined to rainforested areas of the wet tropics of north Queensland. Initially the genus was thought to consist of 3 species; *N.hosmeri*, *N.vestigea* and *N.typancryptis*, which were later on confirmed as the one species *N.dayi*. In montane areas, *N.dayi* occurs around fast flowing, rocky streams or slower watercourses with ample marginal vegetation. At lower elevations, favourite sites include narrow ephemeral streams and rocky outcrops. Females have been found surrounding watercourses of calling males on tall vegetation and large mossy rocks. Calling and resting males are found on rocks, boulders and vegetation in, or adjacent to streams. Australian hylids are opportunistic predators that primarily feed on a wide variety of insects. The blood parasite Trapanosome has been recorded on individuals of *N.dayi*.

Breeding biology (Tyler and Davies 1993; Czechura *et al.* 1987; Hero 1994; McDonald 1990; Barker *et al.* 1995): *N.dayi* breeds from October to April, or in spring and summer. Amplexus is axillary. Large eggs are laid either in a cohesive clump under, or on rocks below, or just above the water line in fast flowing creeks. Up to 107 unpigmented eggs may be laid. Tadpoles are torrent adapted, with a broad circular head and flattened body; colouration is grey to olive green with eyes light pink anteriorly which also have a distinctly

round light patch between them. The muscular tail is cream with dark dorsal pigmentation and a rounded tip. The ventral surface has a dark midline, ventral fins having complete venation whereas dorsal fin has complete dark venation. Total tadpole length at stage 41 is up to 35.6mm. Spiracle is sinistral, anal opening median. A large suctorial oral disc, located on underside of head is surrounded by submarginal and marginal labial papilla. Tadpoles have 2 upper and 3 lower labial tooth rows; formula 2/3. A membranous sac encloses developing hindlimbs and anal opening of tadpole. Larval life is complete usually by no more than 3-4 months, but those spawned in late summer may not complete development until the next summer.

Conservation status (Ingram and McDonald 1993; Hero 1994; Laurance *et al.* 1996): *N.dayi* is listed as endangered and well protected according to the Endangered Species Act, 1992. Its decline was first noted in 1989 and has become more progressive and substantial since. *N.dayi* appears to have disappeared from areas above 300m spanning 20' elevation, but persists at normal population densities in the tropical lowlands. Suggested causes for *N.dayi*'s decline include the 'Extinction wave pattern' initiated by the chytrid fungus and climatic stress, though both remain unsubstantiated in the literature. Organisations involved in conservation of disappearing frogs include Qld Dept. Env., JCU, CRC Trem, UQ, Wet Tropics Management Authority, and Qld Dept. Natural Resources.

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[http://www.biodiversity.environment...en/plans/action_plans/frogs/ accessed on 8/12/99]