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HYLA INERMIS (PETERS), A SPECIES HITHERTO ERRONEOUSLY REFERRED TO THE LEPTODACTYLID GENUS CYCLORANA (ANURA, HYLIDAE/LEPTODACTYLIDAE)

by

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INTRODUCTION

Extensive collections of frogs from Queensland (reported in detail, Straughan, 1966) failed to include the species *Cyclorana inermis* (Peters), although Slevin (1955) recorded it as abundant in central Queensland. However a widely ranging species of ground *Hyla* (undescribed in that genus) occurred frequently in collections from central and northern Queensland. In all external features this species fitted the description of *Cyclorana inermis* given by Parker (1940: 17). In the present paper Peters' syntype of *C. inermis* (reg. no. RMNH 1888) in the Rijksmuseum van Natuurlijke Historie, Leiden, is examined, and compared with the apparently new species of *Hyla*.

MATERIAL AND METHODS

X-ray plates of the feet of the syntype were provided by the Rijksmuseum van Natuurlijke Historie. X-rays of five specimens of *Hyla* sp. were made by the X-ray section of the Department of Veterinary Anatomy, University of Queensland. A further ten specimens were cleared and stained with Toluidine Blue and Alizarin Red S. to distinguish bone from cartilage.

All measurements were made with vernier calipers to the nearest 0.1 mm or with an eyepiece micrometer to the nearest 0.01 mm.

RESULTS AND DISCUSSION

Examination of the digits of the syntype of *Cyclorana inermis* by X-ray (plate 1) established the presence of intercalary cartilages and claw shaped terminal phalanges which are characters diagnostic of the family Hylidae in the Procoelous Anura. The osteology of the feet of the syntype is exactly the same as in all 15 specimens of *Hyla* sp. examined. In all other characters used in previous descriptions and visible on the syntype there is close agreement between the syntype, all specimens of *Cyclorana inermis* available in Australia, and all specimens of *Hyla* sp.

Clearly, the syntype of *Cyclorana inermis* should be transferred to the family Hylidae. As the syntype is a species of ground *Hyla*, the new combination *Hyla inermis* (Peters) should be applied to this species. The species is redescribed below.

Hyla inermis (Peters) [new combination] (fig. 1; pls 1, 2)

Chiroleptes inermis Peters, 1867: 30; Keferstein, 1868: 267; Boulenger, 1882: 271; Andersson, 1913: 16, pl. 1 (2), Andersson, 1916: 12.

Phractops inermis, Nieden, 1923: 524.

Cyclorana inermis, Parker, 1940: 17; Slevin, 1955: 361, fig. 3; Moore, 1961: 329.

Syntype. — Reg. no. RMNH 1888, Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands.

Diagnosis. — *Hyla inermis* is readily distinguished from most other Australian frogs by: vomerine elevations in front of or between the anterior margins of choanae, extremely small discs on fingers and toes, absence of web between fingers, and pointed snout. From species of *Cyclorana*, with which it has previously been linked, by: presence of both outer and inner metatarsal tubercles. From other Australian species of ground *Hyla* to which it is closely related, by: first finger longer than second, back with rounded warts, back of thigh with black and straw reticulations and dark head stripe not fully covering tympanum.

Description. — Habitus slender. Head length approximately equal to head width. Snout rather acutely pointed, projecting well in front of lower jaw, $1\frac{1}{2}$ × diameter of eye. Nostril slightly closer to tip of snout than to eye. Pupil horizontal. Tympanum very distinct, large ($\frac{2}{3}$ to $\frac{3}{4}$ diameter of eye) and very close to eye.

Tongue subcircular, slightly nicked behind. Vomerine teeth small rounded, between the inner front margins of the choanae.

Fingers and toes with extremely small discs (barely wider than rest of digit). Fingers moderately long and slender, free of web. First opposable,

longer than second by disc and at least half the phalanx. Metacarpal and sub-articular tubercles prominent. Outer metacarpal entire. Males with a smooth dark brown nuptial pad on the dorsal surface of first finger (fig. 1).

Toes with well developed web. Typically disc and two phalanges free of web on fourth toe and disc plus at least one half phalanx free on fifth. Small rounded outer metatarsal tubercle and slightly larger more oval inner tubercle.

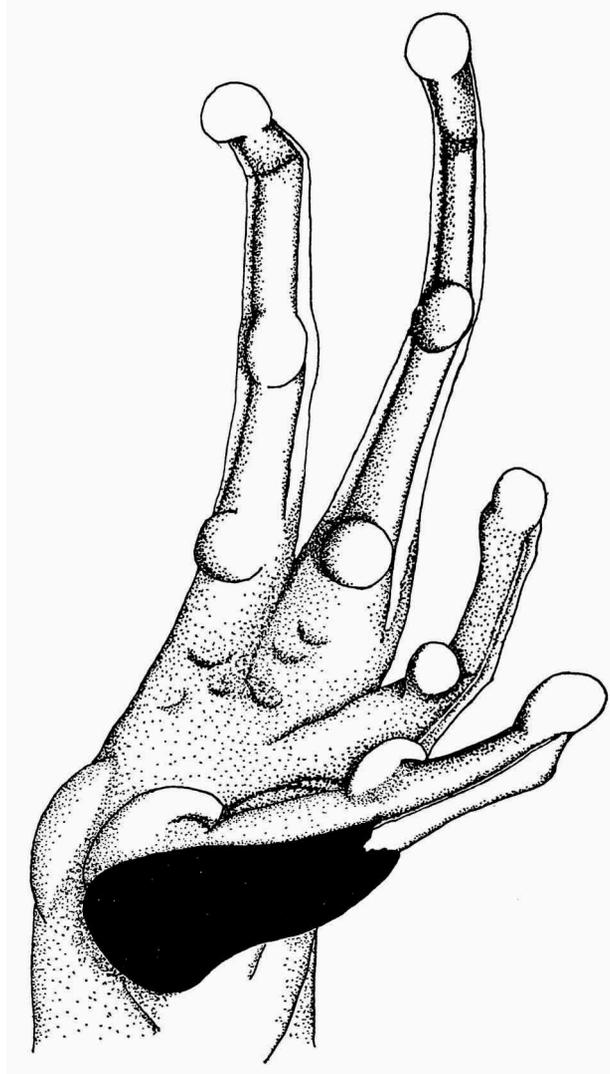


Fig. 1. Hand of *Hyla intermis*, showing the long fingers with a fringe of web, prominent tubercles, opposable first finger, and nuptial pad of the male.

Dorsal surface grey to pale brown with irregular darker patches. Broken dark line across wrist and indistinct darker bands across thigh. An indistinct dark wedge from nostril through eye to just past tympanum, completely broken before eye by vertical white band. Dark blotch on snout between nostrils. Back covered with scattered low rounded tubercles.

Ventral surface white except throat which is dusted with dark specks, and lip which is marked with alternating vertical bands of dark brown or grey and white. Belly granular. Rest of ventral surface smooth. Posterior surface of thigh with narrow black and straw yellow reticulations.

The following ratios are based on 11 ♂♂ and 4 ♀♀ topotypic specimens, collected Rockhampton 31-I-1965 and the syntype of *Cyclorana inermis*, reg. no. RMNH 1888:

Head length/body length	0.35 ± 0.01 (0.31-0.38);	Syntype	0.33
Head width/head length	0.95 ± 0.01 (0.90-1.00);	"	1.00
Tibia length/body length	0.59 ± 0.03 (0.51-0.63);	"	0.56
Eye-snout/diam. of eye	1.57 ± 0.02 (1.50-1.65);	"	1.56

This species closely resembles *Hyla latopalmata* from which it can be distinguished by presence of oval tubercles on dorsal surface. The dark wedge shaped head stripe is cut anterior to eye by a vertical white bar. Posterior to eye, the head stripe is not as well defined as in *H. latopalmata* and does not completely cover the tympanum. The reticulations on the posterior surface of thigh are finer than in *H. latopalmata*. Differences in mating call are also apparent (Straughan, 1966).

Material examined. — Rijksmuseum van Natuurlijke Historie, Leiden: RMNH 1888 — syntype of *Cyclorana inermis*, Rockhampton; Australian Museum, Sydney: R.12069, R.12070, R.12071 — 5 ♂♂, Comooboolaroo; Queensland Museum, Brisbane: unregistered — 6 ♂♂, 1 ♀, Mitchell River Mission; 12 ♂♂, 3 ♀♀, Mt. Finigan (near Cooktown); 2 ♀♀, Mount Molloy; 15 ♂♂, 6 ♀♀, Dimbulah; 8 ♂♂, Walkamin; 6 ♀♀, Mount Garnett; 4 ♂♂, 2 ♀♀, Gunnawarra Station; 1 ♂, Blencoe Creek (west of Kennedy); 5 ♂♂, 2 ♀♀, Valley of Lagoons Station; 47 ♂♂, 11 ♀♀, Cardwell Gap; 12 ♂♂, 3 ♀♀, Ingham; 17 ♂♂, 10 ♀♀, Rollingstone; 23 ♂♂, 10 ♀♀, Bluewater; 16 ♂♂, 11 ♀♀, Bohle; 4 ♂♂, 2 ♀♀, Torrens Creek; 12 juv., Pentland; 11 ♂♂, 2 ♀♀, Campaspie River, Flinders Highway; 19 ♂♂, 1 ♀, Selhiem; 21 ♂♂, 12 ♀♀, Woodstock; 37 ♂♂, 15 ♀♀, Townsville; 1 ♀, Pajingo Station; 28 ♂♂, 16 ♀♀, Bowen; 10 ♂♂, 2 ♀♀, Clermont; 1 ♂, 1 ♀, Thompson River, Muttaborra; 2 ♀♀, Alice River (Capricorn Highway); 11 ♂♂, 4 ♀♀, Rockhampton; 2 ♂♂, Colosseum. Northern Territory specimens: 5 ♂♂, 1 ♀, Plumtree Creek (South Alligator River); 9 ♂♂, 2 ♀♀, Rum Jungle.

Distribution. — North-eastern Australia, coastward of the 15 in. annual rainfall isohyets, from Gin Gin (ca. 24°S. lat.) in the south-east to Hot-springs, Kimberley District, Western Australia in the north-west.

The convergence of this group of ground *Hyla* and the *Cyclorana*, particularly *C. dahl*i and *C. alboguttatus*, is quite marked in external morphology and in habits. Besides the osteological differences the two groups are easily separated by differences in mating call structure.

The original description of Peters (1867) is short and although diagnostic within the genus *Cyclorana*, it is not sufficiently detailed to differentiate *Hyla inermis* from other species of ground *Hyla*. Andersson (1913) expanded the description of *Cyclorana inermis* on the basis of two male specimens from the Kimberley District of Western Australia and provided a figure. These specimens agree completely with the redefinition of *Hyla inermis* except for relatively shorter tibia lengths. Considering the wide geographic separation of his locality from the type locality, this difference is trivial and reference of these specimens to *C. inermis* (now *H. inermis*) should be continued.

Five specimens of the series of 135 from Coomboolaroo reported by Slevin (1955) have been examined (Aust. Mus. nos. R.12069, R.12070, R.12071) and agree in all respects with the redefinition of *Hyla inermis*.

Samples of all known collections of this species agree with the redefinition of *Hyla inermis*.

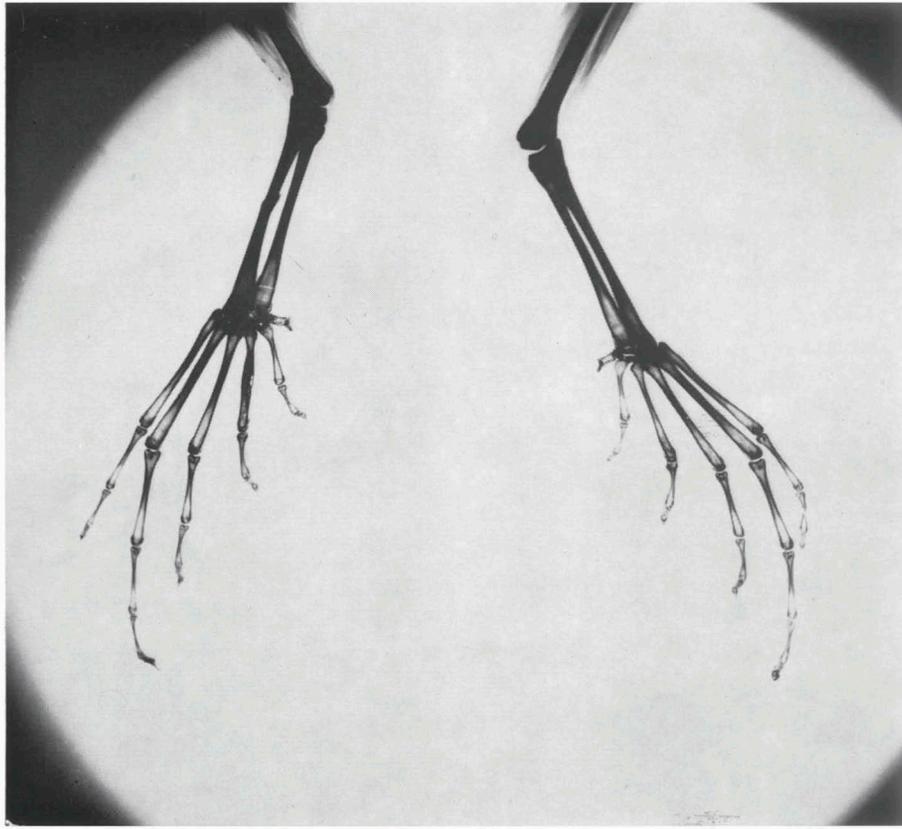
In biology this species closely resembles other species of the "lesueuri complex" defined by Moore (1961: 309). They occur in the vicinity of water courses, lagoons, or swamps. Slevin (1955) collected 135 specimens from the base leaves of pineapple plants. Shelter is more normally found in patches of moisture under logs or rocks in dried swamps, watercourses, or lagoon verges. Males call from banks or on rocks or other solid elevations when water is abundant during the summer months of November to March. The mating call is a loud sharp quacking starting slowly and building rapidly to a crescendo that lasts from one to three seconds.

SUMMARY

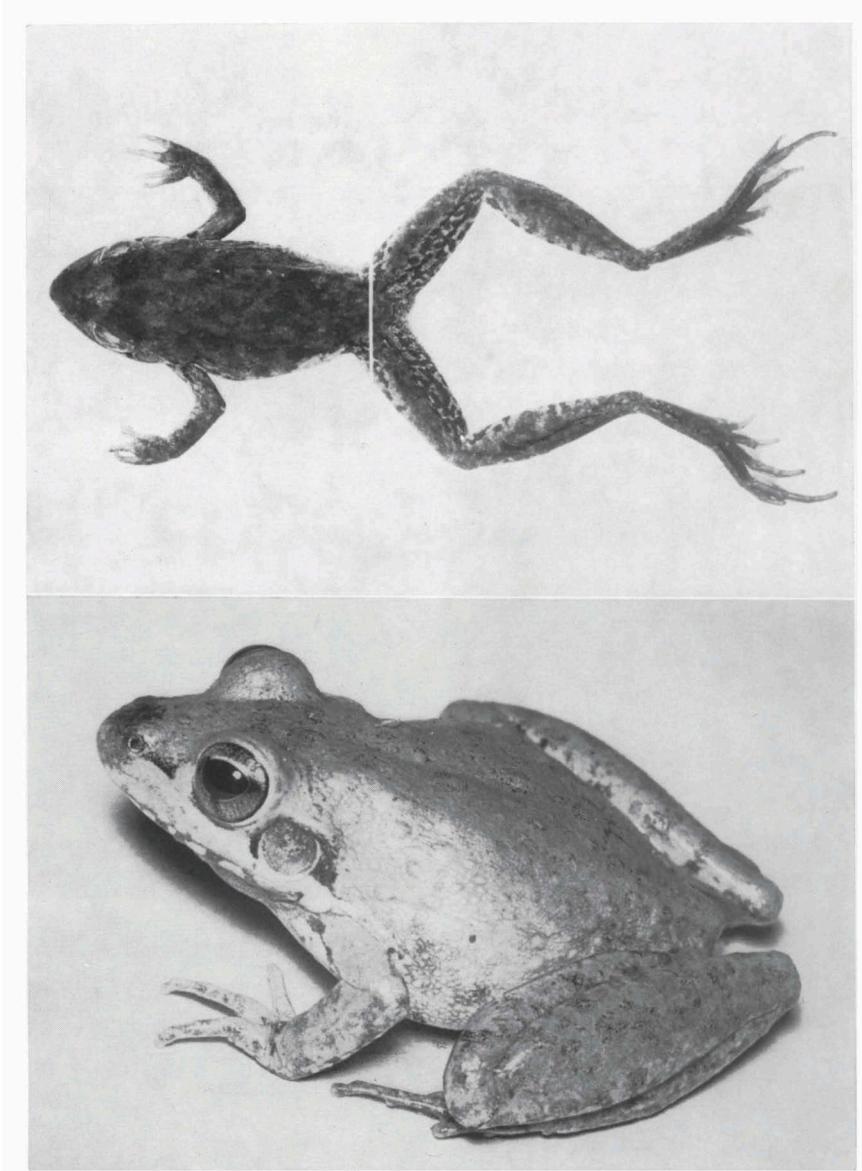
The available syntype of *Cyclorana inermis* (Peters) is examined by X-ray and compared with an apparently new species of ground *Hyla* from northern Australia. These are judged to be conspecific and the presence of intercalary cartilages in the type necessitates the renaming of the species as *Hyla inermis* (Peters).

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Hyla inermis (Peters), X-ray of feet of RMNH 1888 — syntype of *Cyclorana inermis* (Peters). X-ray by J. Simons, Leiden.



a, *Hyla inermis* (Peters), dorsal view of RMNH 1888 — syntype. Photograph by H. F. Roman, Leiden. b, *Hyla inermis* (Peters), ♂, Dimbulah, North Queensland. Photograph by Stanley Breeden.