

Errata inserted 2002: Since the publication of this report the identification of the ‘white frog’ has now been confirmed as *Platymantis polillensis*. Further taxonomic work on *Platymantis luzonensis* is currently being conducted by Rafe Brown from University of Texas, Austin.

## AN ACCOUNT OF THE AMPHIBIAN SPECIES FOUND ON POLILLO ISLAND, PHILIPPINES.

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The following accounts are based upon both anecdotal observations and information gathered from the intensive surveys comparing amphibian assemblages (discussed later). In some cases illustrations of the feet are provided for reference to webbing and tubercle arrangement, which are useful taxonomic features. Any measurements taken are included for reference (Snout Vent length is abbreviated to SV and the mass is in grams). Information on the calls of most species is provided in the sound analysis section. The species accounts provide an introduction and background to the amphibian assemblage comparisons.

### *Rana vittigerra*

This species is frequently seen and heard in rice paddies and amongst coconut plantations. It was not found to breed in streams, therefore probably requires standing water. It was only found at agricultural sites and therefore identified as an agricultural specialist species. *Rana vittigerra* is found in the Philippines and parts of South East Asia, further work is necessary to clarify the nomenclature and taxonomy of this group.

### *Bufo marinus*

The marine toad, known as the Mindoro frog in the Philippines, is found in rice paddies and around human habitation. Originally a forest species from Mexico, this toad has been introduced to different countries around the world as a form of pest control to prevent crop damage, particularly for protection of sugar cane. In different parts of the world it has spread rapidly and devastated native fauna. On Polillo the marine toad was found in exceptionally large numbers, but never in forest. The toad has been on Polillo for at least 15 years, and is found in the North and South of the island. The reason why the marine toad does not live in forest is not known, but it is not due to limited dispersal capabilities. The marine toad was identified as an agricultural specialist species. There was no evidence that the toad affects existing wildlife in forest on Polillo, any effect on agricultural species cannot be determined without knowledge of the native faunal composition before the toads' arrival. It is not known to have replaced any native Philippine amphibians (Alcala and Brown 1998), and it is not found in primary forest elsewhere in the Philippines.

### *Polypedates leucomystax*

The common tree frog is often found on banana trees, hence it's other common name, the banana frog. This species is found most frequently near human habitation and agricultural land, amongst trees and vegetation usually a couple of metres above the ground, but sometimes seen calling in rice paddies perched on the rice stems. A foam nester, it produces large egg masses overhanging shallow water bodies. It was identified as an agricultural specialist species. One adult male was 27g SV 79mm. This species is widespread throughout South East Asia.

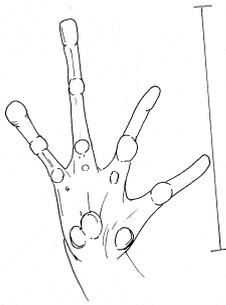
*Kaloula picta*

The fossorial *Kaloula picta*, (known as the single digit chorus frog) is most active after rainfall. Found by residential areas, rice fields and ponds close to human habitation. This species congregates in large numbers after rain beside water bodies and the chorus of this frog is almost deafening.

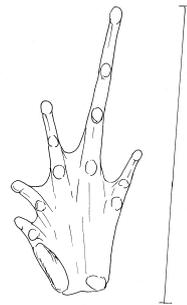
Measurements from two frogs are: 8.8g SV 46 mm, 8.5g SV 45mm. Refer to illustrations of feet, but note that *K. picta* has an inordinate amount of variation in the toe webbing (R. Brown. pers. comm.). *Kaloula picta* is endemic to the Philippines.

*Kaloula* sp.

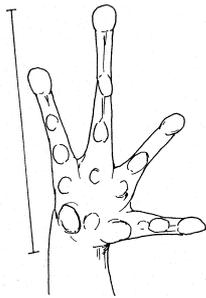
One individual (4g SV 35mm) was found in primary forest amongst leaf litter at 7.30pm on 17/7/99. A second (3g SV 30mm) was found in a pitfall trap in secondary forest on the evening of 23/8/99. Refer to illustration of tubercles on feet. This species is a new record for Polillo. It is rare and possibly restricted to forest based upon the two sightings. This species does not correspond to any of the other *Kaloula* species that are found on the mainland. The taxonomy of this frog is unclear and requires further investigation.



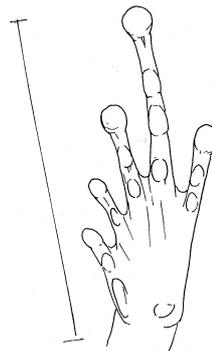
Right hand of *Kaloula picta*. Scale 13mm



Right foot of *Kaloula picta*. Scale 19mm



Right hand of *Kaloula* sp. Scale 10mm.  
Very poorly defined tubercles within palm



Right foot of *Kaloula* sp. Scale 15mm

*Limnonectes macrocephalus*

A large uncommon frog found in low densities. This species is probably more dispersed because of its predatory lifestyle. Its sit and wait tactics are similar to other large ranid species across Asia e.g. *Hoplobatrachus tigerinus*. It is found in primary forest and also

beside large streams in more agricultural habitats. Mean mass 103.4g (n=4, range; 57 to 119.5g), mean SV 121mm (n=4; range 82 to 166mm). The nomenclature of this species has changed, it has been raised to full species level and placed within the *Limnonectes* genus (R. Brown. pers. comm.). It is endemic to Luzon, Mindoro and the Polillo Islands.

*Occidozyga laevis*

Is found in most habitats from agriculture to primary forest, excluding rice paddies and can be in large densities especially in very shallow still water. The pattern on this frog is variable. Sometimes either one or two dorsal stripes are present, and sometimes there is a large light patch behind the head. The call is relatively quiet and these frogs are disturbed from calling very easily. This species is widespread throughout the Philippines and parts of South East Asia.

*Rana woodworthi*

Woodworth's frog is endemic to a small area of Luzon Island (Laguna and Quezon Provinces) and Polillo. One of the most common frogs on Polillo, particularly abundant in forest and found in agricultural areas in lower numbers.

*Rana similis*

This frog is commonly seen beside rivers that border forests and rivers within forest. It often sings among rocks or on branches of plants beside the riverbank sometimes a metre or more above the ground. Often heard calling during the daytime in forest. This frog has been designated to full species level (from subspecies *Rana signata similis*) (R. Brown. pers. comm.). A pair found in amplexus weighed 13.25g SV 59 mm (female), and 4.25g SV 40 mm (male).

*Rana luzonensis*

This frog is seen on leaves or branches up to 2 metres above the ground and occasionally on the ground. *Rana luzonensis* was found beside streams in forest, and fast flowing streams among agriculture that are bordered by trees or bamboo. Females often differ in colouration from the males, sometimes brown or beige in colour. *Rana luzonensis* belongs to the *Everetti* group and has recently been raised to full species level (R. Brown. pers. comm.). It is endemic to Luzon and the surrounding islands.

A pair in amplexus weighed 6.25g (male), 28.5g (female with approximately 900 eggs). Eggs weighed 3.25g.

*Rhacophorus pardalis*

This uncommon frog was found in clustered groups. One group was found amongst bushes beside a temporary pool in a coconut plantation, whereas another group was found in forest. A juvenile was also found in forest at site K, and another in a tree at the paddy field site O (see map of frog survey sites later). Mean mass 7.45g (n=2). This species is found in the Philippines, Borneo and Sumatra.

*Rhacophorus appendiculatus*

One individual was found on the 9/8/99 during the day in primary forest on a tree trunk (3.8g SV 44.5 mm). No others were found on Polillo. However during a visit to Mt

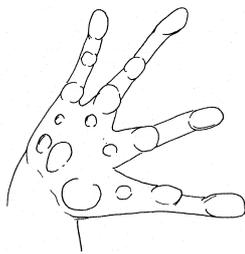
Maquiling, near Mud springs, Los Banos (Luzon Island) several individuals were found and heard calling. This species is found in the Philippines, the Malay peninsula, Borneo and Sumatra.

*Platymantis dorsalis*

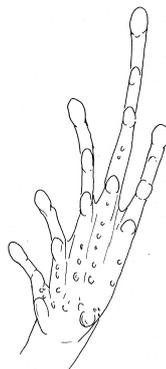
This is a very common frog, which calls from the ground and low vegetation. It is heard among coconut groves and forest, in contrast to the mainland where it is found more strictly in forest. It has a non-granular belly, and there are no tiny tubercles over the base of the foot. Refer to illustration of feet. Varying patterns and colouration, sometimes prominent dorsal stripes, either a single central or two dorsal, frequently the dorsal stripe is absent. *Platymantis dorsalis* is endemic to the Philippines. Mean mass 2.4g (n=16, range; 0.65 to 5.75g), Mean mass of gravid females 5.4g (n=4, 4.95 to 6.2g)

*Platymantis corrugatus*

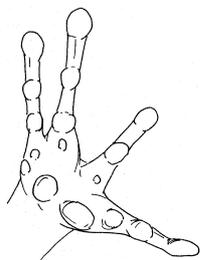
This frog is cryptic, calling from beneath dead wood and overgrown plants and its distribution is clustered. This species is found from coconut groves to primary forest. *Platymantis corrugatus* is endemic to the Philippines. Tiny tubercles are visible over base of foot and the belly is granular. See illustrations of feet. Mean mass 3.25g (n=4, range; 3.0 to 3.85g), Gravid female SV 46 mm 10.5g



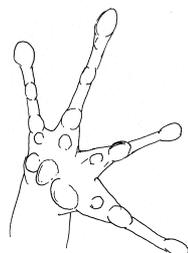
Right hand of female *P. corrugatus*.  
Very prominent tubercles on first two fingers



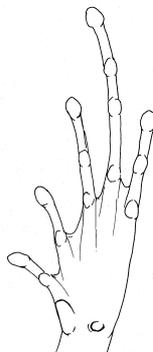
Right foot of female *P. corrugatus*.  
Very small granular tubercles beneath feet



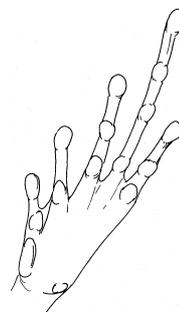
Right hand of *P. dorsalis*



Right hand of female *P. dorsalis*



Right foot of female *P. dorsalis*.

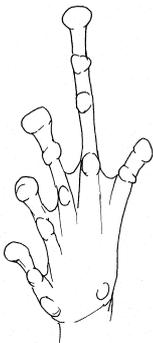


Right foot of *P. dorsalis*, showing prominent projecting tubercles

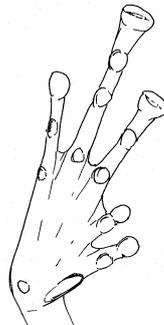
*Platymantis* sp.

This species has previously been misidentified as the Polillo Forest frog (*Platymantis polilloensis*). It is now known to be a member of the *Platymantis guentheri* group. The most similar frog to it on the mainland is *Platymantis luzonensis*. *Platymantis luzonensis* has a more warty appearance than *Platymantis* sp. The calls of the two frogs are very similar (see the sound analysis section). This frog is potentially a different species from *P. luzonensis*, and possibly endemic to Polillo. Its taxonomy requires further work.

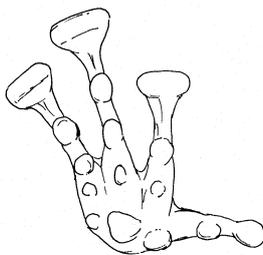
DISTANCE transect data was collected for precise estimations of abundance. These frogs were usually heard calling from at least 2m above the ground, therefore are less likely to be found in transects (see assemblage comparisons) than ground dwelling frogs. According to frequency of calling males these frogs are much less common than both *P. dorsalis* and *P. corrugatus* and their habitat is much more restricted to forest. Refer to section on *Platymantis* sp transects. Mean mass 2.0g (n=3 range 0.8g (juvenile) to 3.05g). Mean female mass 7.09g (n=2). Mean SVL 36.6 mm, (n=7, range 23 to 48)



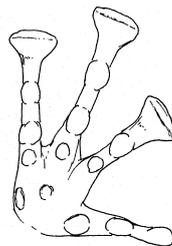
Left foot of *Platymantis* sp



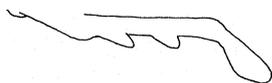
Right foot of female *Platymantis* sp. Large inner metatarsal tubercle, pointed at tip. Very pointed 2<sup>nd</sup> tubercle on outer toe



Right hand of male *Platymantis* sp.  
Male has large tubercle in middle of palm.



Right hand of female *Platymantis* sp. Corresponding tubercle on the female is small. Groove visible across fingertip



Profile of outside finger of right hand:

1 small tubercle at base of hand, 1 small tubercle at base of finger, 2 large tubercles on finger

The White frog

A small white frog was found on Polillo. It resembles closely *Platymantis sierramadrensis*, described in 1999 (Brown, W.C., *et al.* 1999). One individual (0.325g

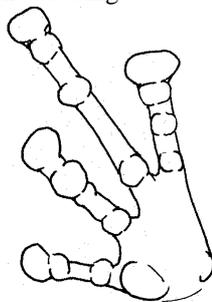
SV 19 mm) was found on 14/8/99, 1m above ground on a leaf next to a stream at site K, Sibulan watershed reserve. On the 9/9/99 a white frog (0.5g SV 22 mm) was found calling (call recorded 2140 hours 25°C) from ferns 2m high above a small stream, North Polillo, near Panukulan. On the 11/9/99 a white frog (0.55g) was heard calling from same location as on the 9/9/99, possibly the same individual.

The table below gives descriptions of the hands and feet of *P. polilloensis* from Taylor (1922) and Inger (1954), which resemble closely the drawings of the white frog, (see diagram) and comparative descriptions of *P. sierramadrensis* from (Brown et al. 1999).

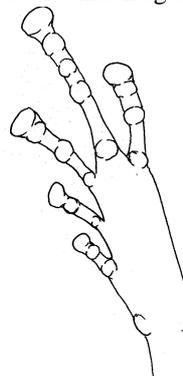
Inger	Taylor	<i>P. sierramadrensis</i>
Tips of fingers broadly dilate into truncate discs with horizontal circummarginal grooves. First finger shorter than second. A supernumerary tubercle on each metacarpal	Tip of each of the three outer fingers with a strongly dilated pad, nearly twice the width of the digit. Inner finger very small, slender without pad. Subarticular tubercles large, flat, moderately well defined. A single large carpal tubercle. No trace of web	Fingers with minute webs at base; fingers except first with broad disks; fingers with shallow circummarginal grooves. Finger discs broader than those on toes. First finger shortest, third longest and second and fourth approximately equal, subarticular tubercles large, round, low: a row of low, inconspicuous supernumerary tubercles on palm; inner, middle and outer metacarpal tubercles oval, vague, inner and middle about equal in size; larger than outer.
No supernumerary tubercles on the foot. Tips of toes dilated, the discs smaller than those of fingers; web reaching centre of proximal subarticular tubercle on first, second and fourth toes, distal edge of tubercle on third, and between subarticular tubercles on fifth toe. Web extending to disk of fourth toe as a narrow fringe; third toe slightly longer than fifth; first toe, measured from distal edge of inner metatarsal tubercle, less than twice the length of the tubercle; two metatarsal tubercles, the outer one not distinct; without supernumerary tubercles on the foot.	Tips of toes distinctly dilated. Not more than one and one half times the width of the digit. Fourth toe very long. Third and fifth equal, barely reaching third subarticular tubercle from the disc on fourth toe. Inner metatarsal tubercle rather large but ill defined. Outer small, dim.	Terminal phalanges rounded, toes webbed to distal edge of tubercle on first and second, to distal edge of basal tubercle on third, and to midway between tubercles on fifth. Disks of toes narrower than those of fingers, subarticular tubercles rounded, low; platar area smooth; inner metatarsal tubercle elongated, outer vague; dorsum smooth, without tubercles;

Left hand of white frog showing tubercles and dilated digits

No apparent webbing

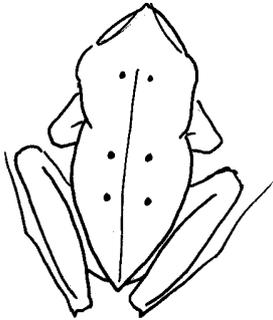


Foot of white frog showing tubercles

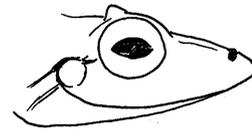
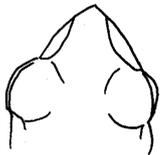
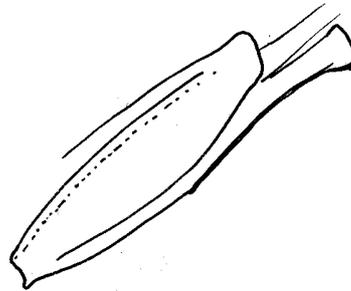


Description of white frog	From Taylor 1922: <i>Philautus polilloensis</i>	<i>P. sierramadrensis</i> from Brown et al 1999.
Prominent tubercle on each eyelid	Single large conical tubercle on upper eyelid near outer middle edge. Inger: Low papilla on upper eyelid	
Very pointed tip to snout	Tip of snout conical. A distinct tubercle on tip of jaw. (Inger: Snout acutely pointed)	
Pupil horizontal	Pupil horizontal	
Small tympanum, one third diameter of eye.	Tympanum rather indistinct, diameter 1 third to 1 fourth of eye. (Inger: Tympanum visible, 1 third diameter of eye.)	
Clear supra tympanic fold, and another fold beneath tympanum, Small fold from tympanum to shoulder	A strong fold above tympanum to near insertion of arm dimly granular. A second fold from a point above and behind tympanum to lower jaw. There is some variation in the folds about the tympanum, some of these specimens show these very dimly. (Inger: A supratympanic fold from eye to axilla).	
Prominent tubercle on heel	A strong tubercle at heel.	Conical tubercle on heel
Pointed anus	A small tubercle on back above anus	
Granular belly	Belly and underside of femur strongly granular. Skin of throat and belly smooth, with numerous minute pit like depressions. No 349 with Pit like depressions in skin of lower jaw not evident, the tubercles on the back are dimmer. (Inger: Belly with coarse granules)	Venter generally smooth, coarsely granular in some specimens
See diagram for tubercle positions and pigmentation	Skin above practically smooth with two small tubercles between shoulders and two pairs on back. (Inger: Skin of back smooth with a few scattered tubercles. No longitudinal ridges). A row of granules from behind tympanum to arm, parallel to supratemporal fold	smooth skin, dorsum smooth without tubercles.
SV: 22 mm 19 mm	SV 27 mm female, 22.5, 20, 19, 17, 15. (Inger: male with vocal sacs 20.3 & 22.6 mm SV)	SV 22.7-25.2; mature males, 25.7 for 1 mature female.
Colour in life:	Colour in life: Between the 7 co types, vary more or less in markings but the colouration is identical	
Darker yellow brown under legs, Yellow beneath thighs and hind legs	Chin and throat yellow with very sparse peppering of brown; underside of leg and foot strongly peppered with brown. (Inger: No areolations on the groin).	
Thin very pale straight stripe down dorsum	Numbers 352 to 354 have a hairline from between the eyes to above the anus	
Above creamy/ off white. Slightly darker pigmented spots as labelled in diagram (dark bar between eyelids and on dorsum), and slightly darker patch on digit. Mask on face from eye to snout	Above creamy white to yellow, slightly pigmented with minute dots of cinnamon brown. No 350 Almost white when taken. A bar of cinnamon between eyes and dim spots about the dorsal tubercles. No 350 The pigment is heavier between the eyes and as far forward as the line between the eyes. Upper eyelids dark gray to blackish. Dim bars on tibia and femur.	pale creamy colour without brown/ blackish markings on body or limbs and without areolations. In preserved specimens, faint scattered brownish flecks are evident on dorsal and lateral surfaces
Thin dotted stripe along upper side of each calf, down leg (see diagram), and off white stripe bordering the outside of every finger	Spots on outer digits of all limbs. The distinct spots on the two outer fingers is very characteristic	
White belly	Underside of hand and belly immaculate	
Iris periphery turquoise		

Schematic drawing to show arrangement of prominent coloured tubercles.



Right leg of white frog: Dotted line along back of leg, and fringe of white borders edge of toe



Head of *Cornufer polilloensis*. (Inger)

Head of white frog

Both have pointed snouts, the drawing from Inger does not show tubercle on eyelid but it is given in the description

The description of the white frog corresponds closely to both Inger's and Taylor's descriptions of the original *P. polilloensis* specimens (referred to as *Philautus polilloensis* by Taylor and as *Cornufer polilloensis* by Inger). See accompanying diagrams of the white frog. However the very distinctive turquoise periphery to the iris is not described by Taylor from the original live animals, leaving doubt as to whether the white frog could be *P. polilloensis*. The blue ring seems to be a character uniting all hazelae group species (R. Brown pers. comm.). The description of *P. sierramadrensis* also matches the white frog, but their calls are compared in the sound analysis section and found to be distinct. However the comparison is only between calls from populations of *P. sierramadrensis* in the Northern regions of the Sierra Madre Mountains.

To resolve the identity of the white frog, more specimens are necessary to compare to the original *P. polilloensis* and *P. sierramadrensis* specimens, and more recordings of each of the calls are necessary to confirm without doubt calling pattern and rate differences. Further comparison is necessary between the white frog and Southern populations of *P. sierramadrensis*.

#### Notes

Eggs presumed to be from a platymantis species were found in a tree hollow. Many gravid *platymantis* individuals were seen however none could be induced to lay eggs or even call when kept in captivity. Several tiny *platymantis* were found but neither in great abundance to locate a hatching site nor with any strong association with water. Further investigations into the natural history and reproductive strategies of these species should be investigated.