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The Amphibians and Reptiles of Panay Island, Philippines

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Abstract.- We provide species accounts for 20 amphibians (frogs and toads) and 72 reptiles (one turtle, 36 lizards, and 35 snakes) from the central Philippine island of Panay and its associated land-bridge islets. Panay is a moderately-sized island (123,000 km^2) that currently is separated from the nearby islands of Negros, Masbate, and Cebu by shallow seas, indicating that dry land connections once allowed free exchange of flora and fauna between these land masses at several periods during the Pleistocene. This fact, coupled with the wealth of knowledge on herpetological communities of Negros and Cebu, has led biologists to assume that the amphibians and reptiles of Panay are reasonably well known. Our data suggest that this is far from true. Our recent survey work (1989 until present) has resulted in the discovery of at least six (and probably 12–15) new species of vertebrates, most of which appear to be high elevation rainforest Panay endemics. In this paper we note numerous taxonomic problems that await the attention of biologists; these surely will result in an increase of the known species from Panay. We expect that many widespread species complexes currently of uncertain taxonomic status will eventually be recognized as Panay endemics, further bolstering the total diversity and degree of endemism on Panay. The status of Panay herpetofauna warrants particular attention because many of the suspected new and endemic species appear to be forest obligates. With the near complete removal of Panay's low elevation forests and increased pressure on its mid– and upper montane forests, we suspect that many of Panay's endemics are threatened by extinction. Panay should be regarded as a tropical island with a unique geological history, a spectacular compliment of habitat types, and a diverse set of species communities – all of which are beset with a conservation crisis of deforestation and probable extinction. Panay may be a particularly appropriate model island for large scale conservation efforts aimed at sustainable management of forest resources. However, before informed conservation and management plans can be enacted, additional biodiversity survey work must be conducted on Panay.

Key words.- Reptiles, amphibians, SE Asia, Philippines, Panay, Visayan Islands, conservation crisis, herpetofauna.

Introduction

The central (or "Visayan") Philippine island of Panay (Figs. 1, 2), is part of a Pleistocene aggregate island complex that includes Negros, Cebu, Guimaras, Masbate, Ticao, and several small land-bridge islands associated with each of these larger land masses. Although amphibian and reptile species similarity among Visayan Islands was noted much earlier (Taylor, 1920, 1922a-d, 1928; Inger, 1954; Leviton, 1963c; Brown and Alcala, 1970a), it was not until Heaney (1985, 1986) explicitly illustrated the position of the 120 m underwater bathymetric contour in the Philippines that the land bridge implications of channel depth became fully appreciated by biologists. It is now understood that five major Philippine island groups, (complexes of islands separated by shallow channels) intermittently formed much larger land mass amalgamations at various times during the mid- to late-Pleistocene (Fig. 1). It is presumed that these events allowed free exchange of fauna and flora via land-positive connections between the otherwise isolated islands of today. Each of the Philippine Pleistocene aggregate island platforms (Fig. 1) are now recognized by biogeographers as subprovinces (Taylor, 1928) due to the fact that each supports highly-celebrated suites of endemic taxa (Taylor, 1928; Dickinson, 1991; Heaney and Regalado, 1998; Heaney et al., 1998; Alcala and Brown, 1998; Kennedy et al., 2000).

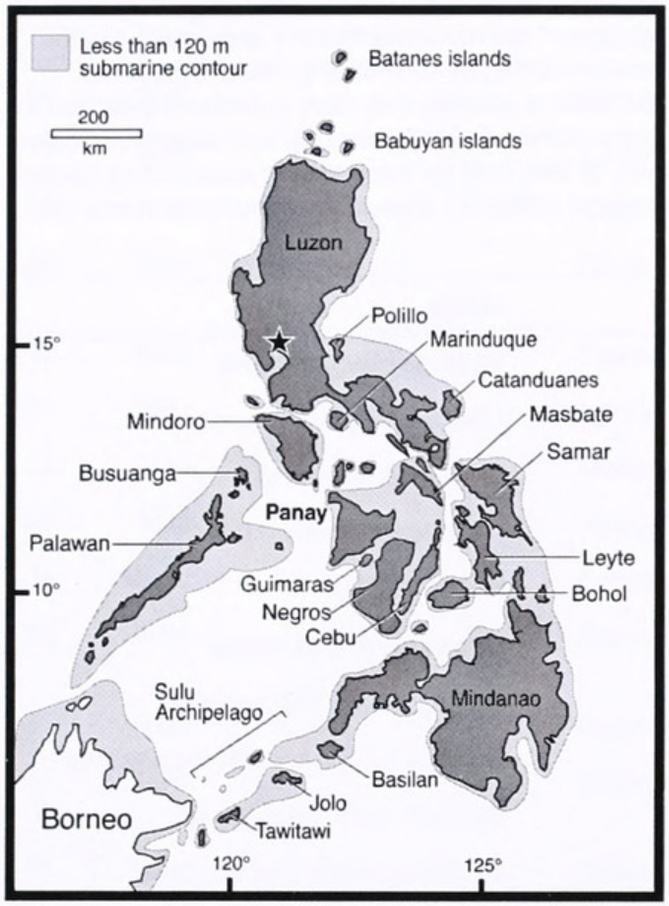

Figure 1. The Philippines (darkly shaded islands), with the major Pleistocene aggregate island platforms indicated by tracing of the 120 m submarine bathymetric contour (following Heaney, 1985, 1986). Star = Manilla.

One unfortunate result of the prevailing perspective since Heaney's (1985) landmark paper, has been herpetologists' lack of attention to islands that are land-bridge (once connected by dry land) to well surveyed members of the same Pleistocene island complex. A case in point is Panay, a central Philippine island of 123,000 km^2 with several mountain peaks of more than 2000 m in elevation (Figs. 1, 2). Perhaps not unreasonably, numerous biologists over the past century have assumed or suggested that a species' presence on the well-surveyed Negros implied its undocumented presence on Panay as well (see Inger, 1954; Leviton, 1963; Brown and Alcala, 1970, 1978, 1980, 1986; Brown and Rabor, 1967; Alcala, 1986). Nevertheless, cases of low-level island endemism have been documented on individual islands within Pleistocene island complexes (Alcala, 1958, 1962; Taylor, 1920; 1922a–d; 1923; 1925; Inger, 1954;

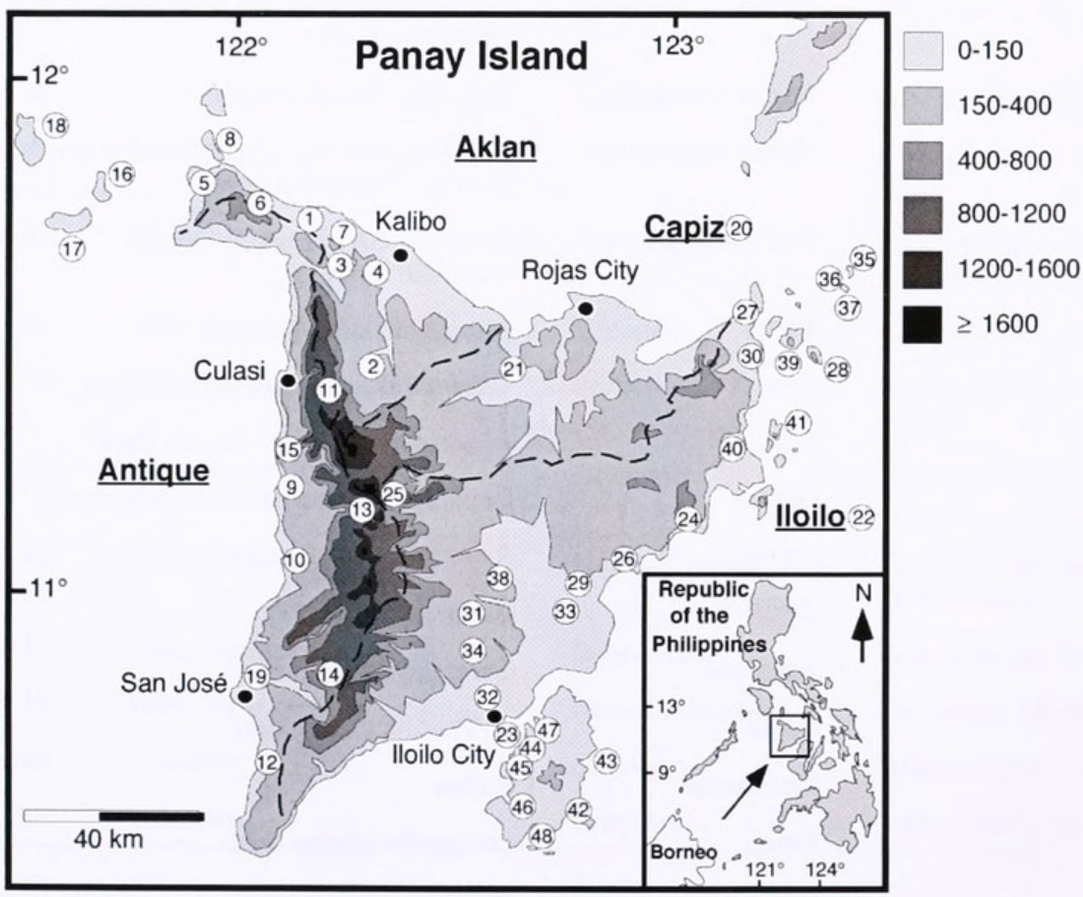

Figure 2. Panay Island, its position in the Philippines indicated by darkened arrow (inset). Discrete shading indicates increasing elevational increments (see key), enclosed numbers indicate collection localities (see Table 1), underlined bold text indicates provinces (boundaries indicated with darkened dashed lines), and darkened circles indicate major cities.

Table 1. Study sites and collection localities for museum specimens of amphibians and reptiles from Panay Island. "No further data available" indicates specimens for which municipalities were the only available collection data in museum catalogs. The term "municipality" is synonymous with "town" but municipalities are also the political entity surrounding towns by these names. Thus, municipalities contain small surrounding villages (Barrios [="Barangays "] which may contain smaller "Sitios"). It is reasonable to assume that most collections localized to the municipality level were also collected in the town of the same name. Entries including "and vicinity" indicates specimens that may have been collected in the municipal town, or they may be from smaller surrounding Barangays. * Combined into a single locality due to the close proximity of collection sites at the common borders of these municipalities.

Site	Province	Municipality	Notes
1.	Aklan	Ibajay	Barangay Bugtong-bato
2.	Aklan	Libacao	Libacao town "and vicinity"
3.	Aklan	Makato	Makato town "and vicinity"
4.	Aklan	Malinao	no specific locality data
5.	Aklan	Malay	Nogas Point
6.	Aklan	Nabas	Nabas town "and vicinity"
7.	Aklan	Tangalan	Tangalan town "and vicinity"
8.	Aklan	Malay	Borocay Isl., no specific locality data
9.	Antique	Barbaza	Barbaza town "and vicinity"
10.	Antique	Bugasong	Bugasong town "and vicinity"
11.	Antique	Culasi	Barangay Alojipan (Mt. Madja-as; PNM/CMNH site)
12.	Antique	Tobias Fornier	Barangay Tobias, Villaflor
13.	Antique	Valderrama	Barangay San Agustin, (Mt. Baloy and vicinity; PNM/CMNH site)
14.	Antique	San Remegio	Barangay Aningalan, Aningalan mountain range
15.	Antique	Tibiao	no specific locality data
16.	Antique	Caluya	Caluya Isl., no specific locality data
17.	Antique	Sibay	Sibay Isl., no specific locality data
18.	Antique	Caluya	Semirara Isl., no specific locality data
19.*	Antique	Hamtik	Barangay Gunisang-an
		Sibalom	Barangay Egaña
		San José	Barangay Bagumbayan
20.	Capiz	Capiz	no specific locality data
21.	Capiz	Marubusao	Burias
22.	Iloilo	Iloilo	no specific locality data
23.	Iloilo	Iloilo City	Iloilo City "and vicinity"
24.	Iloilo	Ajuy	no specific locality data
25.	Iloilo	Calinog	Mt. Baloy and vicinity

Site	Province	Municipality	Notes
26.	Iloilo	Barotac Viejo	Barangay San Francisco
27.	Iloilo	Carles	no specific locality data
28.	Iloilo	Carles	Sicogon Island; including Buaya area
29.	Iloilo	Dingle	Bulabog-Putian National Park; PNM/ CMNH Site
30.	Iloilo	Estancia	no specific locality data
31.	Iloilo	Lambunao	no specific locality data
32.	Iloilo	Mandurriao	no specific locality data
33.	Iloilo	Pototan	Pototan town "and vicinity"
34.	Iloilo	Cabatuan	no specific locality data
35.	Iloilo	Estancia	Gigante North Isl., no specific locality data
36.	Iloilo	Estancia	Gigante South Isl., Gabi area
37.	Iloilo	Estancia	Gigante South Isl., no specific locality data
38.	Iloilo	Calinog	E. Catalbac ("Calinog town")
39.	Iloilo	Estancia	Calagna-an Isl.; Barangkalan and vicinity
40.	Iloilo	Concepcion	ca 1 km NW SBS Iyang Beach Resort
41.	Iloilo	Concepcion	Pan de Azucar Isl., no specific locality data
42.	Negros Occidental	Pulupandan	Inampulagan Isl., 8 km W Munic. W. Pulupandan, Negros Occ. Prov.
43.	Iloilo, Subprov. Guimaras	Unknown	Guimaras Isl., no specific locality data
44.	Iloilo, Subprov. Guimaras	Jordan	Guimaras Isl.; Jordan town "and vicinity"
45.	Iloilo, Subprov. Guimaras	Unknown	Guimaras Isl.; 2.1 km SW Daan Banwa
46.	Iloilo, Subprov. Guimaras	Nueva Valencia	Guimaras Isl.; Nueva Valencia town "and vicinity"
47.	Iloilo, Subprov. Guimaras	Buenavista	Guimaras Isl.; Buenavista town
48.	Iloilo, Subprov. Guimaras	Nueva Valencia	Panobolon Isl.; Nueva Valencia town.
49.	Unknown	Unknown	"Masaya" (not on available maps)
50.	Unknown	Unknown	Panay Island: no Further Data

Brown and Alcala, 1961, 1970a–b, 1978, 1980, 1982a, 1986, 1994; Brown et al, 1997a–b; Brown et al., 1999), suggesting that the two large islands warrant individual attention by biogeographers. Despite the assumption that many widespread Philippine species were present on Panay (e.g., see Alcala, 1986), biogeographical summaries and taxonomic reviews historically have listed only nine vouchered (based on museum specimens) species of snakes, six geckos, six skinks, and seven frogs (Inger, 1954; Leviton, 1963c; Brown and Alcala, 1970, 1978, 1980) – 30% of the herpetofauna considered in the present report.

Until very recently the higher elevation forested regions of Panay have not been explored by biologists. At present, the results of only a few preliminary surveys in a few high elevations localities are available (Gonzales and Kennedy, 1990, 1996; Sison et al., 1995; Ferner et al., 1997; Brown et al., 1997a; 1999).

The purpose of this paper is to synthesize museum records that document the diversity, endemism, status, and distribution of the amphibians and reptiles from Panay and to report on several recent collections resulting from the National Museum of the Philippines/Cincinnati Museum of Natural History Philippine Biodiversity Inventory (1989–1994). Another primary goal is to draw attention to recently-discovered endemic species of amphibians and reptiles from Panay and to stress the need for immediate faunal surveys on this tropical island beset by a conservation crisis of deforestation.

Material and Methods

Study sites and collection locations are presented in Table 1 and shown in Figure 2. Additional site and habitat information for many TNHC, PNM, CAS, FMNH, and CMNH specimens may be found in the museum catalogs. The PNM/CMNH Philippine Biodiversity Inventory team conducted field studies at sites 11 and 13 (Figs. 3–9) and various members of the team (particularly RVS and RMB), visited other locations (Figs. 10–14) to do more limited surveying. We established elevational transects in a variety of habitat types (Ruedas et al., 1994, as modified by Brown et al. 1995a, 1996, 2000) and utilized standard collection and specimen preservation techniques (Simmons, 1987; Heyer et al., 1994). Detailed examination of all material was conducted by RMB and JWF.

We follow the taxonomy of Taylor (1922c), Brown and Alcala (1978, 1980) and Brown et al. (1995a; 1995b) for gekkonid and scincid lizards. The taxonomy of Inger (1954, 1996), Frost (1985), Duellman (1993), Brown and Alcala (1994), Inger and Tan (1996), Alcala and Brown (1998) and Emerson et al. (2000), was consulted for amphibians and we include (in parentheses) the unsubstantiated taxonomic hypotheses of Dubois (1992) for reference. While no suitable taxonomy currently is available for Philippine agamids (see Taylor, 1922c), we consulted Musters (1983) and McGuire and Alcala (2000) for identification of our *Draco* specimens. Snake taxonomy was based on Taylor (1922a), Leviton's "Contribution to a Review of Philippine Snakes" series (Leviton 1961, 1962, 1963a–c, 1964a–d, 1965, 1967, 1968, 1970a–b, 1979, 1983, 1985), Leviton and Brown (1959), Inger and Marx (1965), Malnate and Underwood (1988), Wynn and Leviton (1993), McDiarmid et al. (1999), and Brown et al. (1999). Scale counts on snakes were taken using the methods of Dowling (1951a, 1951b). Field techniques in our surveys have been described in Ruedas et al. (1994) and Brown et al. (1995a; 1996; 2000). Museum abbreviations follow Duellman et al. (1978) and Leviton et al. (1985).

In order to examine large scale faunal similarities between Panay and other large island of the Philippines, we assessed overall herpetofaunal simmilarities by calculating coefficients of similarity using a simple index (C = 2W/a+b; see Brown and Lomolino, 1998, for review) for the amphibians and reptiles of Panay and other islands. Our data for these calculations were based on all available literature (above) and updated conservative estimates of the taxonomy of Philippine amphibians and reptiles (Brown, Crombie, Diesmos, unpublished data).

Results

We present records for 20 amphibians (anurans; Figs. 15–25), and 72 reptiles (one turtle, 36 lizards, and 35 snakes; Figs 26–52) from Panay and its associated land-bridge islets. The results of faunal similarity calculations are presented in Figure 53. Individual species accounts, with comments on their status, are presented below.

Species Accounts

Amphibia

Anura

Bufonidae

Bufo marinus (Linnaeus) (Fig. 15)

Introduced on most inhabited islands of the Philippines (Inger, 1954; Diesmos, 1998; Alcala and Brown, 1998), this species is particularly common in agricultural areas and near human habitation. It is widespread and abundant in disturbed and agricultural areas on Panay.

Localities and specimens: (Site 1) PNM 1144–47, 1228–33; (Site 11) CMNH 4958–59, PNM 1289–96, 2552–54; (Site 12) PNM 1232–33; (Site 19) CMNH 5197; (Site 23) USNM 339985–86; (Site 24) FMNH 61482–84; (Site 31) PNM 1144–47; (Site 33) USNM 339987–88, 340062.

Microhylidae

Kaloula conjuncta negrosensis Taylor (Fig. 16)

Taylor (1920, 1922a) first collected this form on Negros and Guimaras islands. He (Taylor, 1922a) recognized it as a full species but Inger (1954) placed *K. negrosensis* in the synonymy of Luzon's *Kaloula conjuncta*; no further taxonomic studies have been forthcoming. *Kaloula conjuncta negrosensis* is both a burrower and a climber (Taylor, 1920; Alcala, 1962, 1986); it has been found in the detritus of the forest floor (750–1075 m on Negros; Alcala, 1962) and in the leaf axils and holes of trees (Alcala 1962). They also emerge and congregate around water that collects in pools and ditches in the rainy season (Taylor, 1920, 1922a). Our Mt. Madja-as specimen was found in a tree hole 10 cm from the ground (tree < 0.5 m dbh). Specimens from near the base of Mt. Baloy were found in breeding aggregations around water buffalo wallows near a large river. We suspect that the Visayan populations represent a distinct evolutionary lineage and that they will eventually once again be recognized as a full species once new data become available (Brown and Diesmos, unpublished data).

Localities and specimens: (Site 8) CAS 127890; (Site 11) PNM 2555; (Site 13) TNHC 56340–46; (Site 16) CAS 127510–11, 127591; (Site 18) CAS 127815; (Site 47) CAS 124446.

Kaloula picta (Dumeril and Bibron) (Fig. 17)

This frog is found at low elevations (100–200 m) in open areas near human habitations (Boulenger, 1882; Alcala, 1956, 1958). It is a burrowing species that conceals itself under leaf litter and topsoil until the beginning of the rainy season. Choruses may contain hundreds of individuals (Alcala, 1962; Alcala and Brown, 1998). This appears to be the first published account of this species on Panay.

Localities and specimens: . (Site 16) CAS 127617–37; (Site 18) CAS 127816, 127827; (Site 23) CAS–SU 14219–20; USNM 78079–80, 78842.

Kaloula sp.

In 1992, while conducting survey work at Barangay Alojipan (Site 11), we heard the distinctive honking calls of a forest species of *Kaloula*. Although we were unable to locate and collect specimens, we noted that the calls were superficially similar to *Kaloula kalingensis* (Taylor, 1922a; single honk, delivered approximately every 15 to 20 minutes) from Luzon. Neither *Kaloula kalingensis* nor the related *K. kokacii* (Ross and Gonzales, 1991) have been reported from the nearby island of Visayas, although recent field work in the last remaining low elevation forests of Negros (Municipality of Ayungon, Negros Oriental Prov.; C. N. Dolino and A. C. Diesmos, personal communication) reveals the presence of a forest species (also previously unrecorded) with single honking calls there as well. Gaulke (in press) recently has discovered a population of *Kaloula* in NW Panay that may be the same as that heard (but not collected) previously on Panay and Negros.

Localities and specimens: none.

Ranidae

Limnonectes cf. *leytensis* (Boettger) (Fig. 18)

This species is widely distributed in patches and considered common in some localities on the nearby Negros (Alcala, 1986; Alcala and Brown, 1998). However, it has been collected from only one locality on Panay (Sison et al., 1995). On Negros, this species inhabits coolor high elevation mountain streams between 150 and 900 m (Alcala, 1962) and probably breeds terrestrially but deposits eggs in close proximity of water (Alcala and Brown, 1956; Alcala, 1962; Brown and Alcala, 1982b). When hatching, terrestrial embryos of these and related species fall, are carried by males, or are washed into water (Alcala, 1962; see also Inger et al., 1986; Brown and Iskandar, 2000). We find it doubtful that Visayan specimens identified

Table 2. List of known species from Panay and smaller, nearby, land-bridge islands and other islands within the political boundaries of major Panay Island provinces. Entries include Panay species with vouchered specimens in major museum collections (see text and species accounts for discussion of taxonomy used) and the first published accounts by authorities utilizing museum specimens. IR = island record or first published record from within major Panay island provinces. (1 Previously reported from Panay, nearby islets, or Visayan sea by Alcala (1986) but without specific reference to specimens. 2 See also Gaulke (in press). 3 Recorded from land-bridge islets but currently not recorded from the mainland of Panay. 4 A record from Semirara Isl., within the political boundary of Panay's Antique Province, but land-bridge to Mindoro Isl.; not likely to be discovered on Panay in the future. 5 Apparent major range extension, in need of verification or based on specimens with locality data probably in error.)

Bufo marinus	Inger, 1954
Kaloula conjuncta negrosensis	IR (see Taylor, 1920; 1922a)[1]
Kaloula picta	IR
Kaloula sp.	IR[2]
Limnonectes cf *leytensis*	IR
Limnonectes visayanus	Inger, 1954
Occidozyga laevis	Inger, 1954
Platymantis corrugatus	IR[2]
Platymantis dorsalis	IR[2]
Platymantis negrosensis	Sison et al., 1995
Platymantis insulatus	Brown and Alcala, 1970b[3]
Platymantis panayensis	Taylor, 1920; Inger, 1954; Brown et al., 1997a
Platymantis sp. 1	IR
Platymantis sp. 2	IR
Platymantis sp. 3	IR
Rana cancrivora cancrivora	Inger, 1954
Rana erythraea	Inger, 1954
Rana cf. *everetti*	Sison et al., 1995
Rana vittigera	IR
Polypedates leucomystax	Inger, 1954
Cuora amboinensis amboinensis	Gaulke and Fritz, 1998
Bronchocela sp.	Taylor, 1922c
Draco spilopterus	Musters, 1983
Hydrosaurus pustulatus	IR[2]
Gonocephalus sp.	Sison et al., 1995
Cosymbotus platyurus	Brown and Alcala, 1978
Cyrtodactylus annulatus	IR[2]

Cyrtodactylus philippinicus	IR
Gehyra mutilata	Brown and Alcala, 1978
Gekko gecko	Taylor, 1922c; Brown and Alcala, 1978
Gekko gigante	Brown and Alcala, 1978[3]
Gekko mindorensis	Sison et al., 1995
Hemidactylus frenatus	Brown and Alcala, 1978
Hemidactylus stejnegeri	Sison et al., 1995
Hemiphyllodactylus insularis	Brown and Alcala, 1978
Lepidodactylus lugubris	Brown and Alcala, 1978[3]
Lepidodactylus planicaudus	Brown and Alcala, 1978
Brachymeles boulengeri taylori	IR
Brachymeles talinis	Brown and Alcala, 1980
Brachymeles tridactylus	Brown and Alcala, 1980
Dasia grisea	Brown and Alcala, 1980[4]
Dasia semicincta	IR[5]
Emoia atrocostata	IR[3]
Lamprolepis smaragdina philippinica	Brown and Alcala, 1980
Lipinia pulchella taylori	IR
Mabuya indeprensa	Sison et al., 1995
Mabuya multicarinata borealis	IR
Mabuya multifasciata	IR[2]
Parvoscincus sisoni	Ferner et al., 1997
Sphenomorphus arborens	Brown and Alcala, 1980
Sphenomorphus coxi divergens	IR[5]
Sphenomorphus cumingi	IR[5]
Sphenomorphus jagori grandis	Brown and Alcala, 1980
Sphenomorphus steerei	Brown and Alcala, 1980
Tropidophorus grayi	Sison et al., 1995
Varanus salvator nuchalis	Gaulke, 1991a, 1991b, 1992
Acrochordus granulatus	IR
Python reticulatus	Leviton, 1963c
Ahaetulla prasina preocularis	Leviton, 1963c, 1968
Boiga angulata	IR[2]

Boiga cf *cynodon*	IR[2]
Boiga cf. *dendrophila*	IR
Calamaria gervaisi	Leviton, 1963c; Inger and Marx, 1965
Cerberus rynchops	Gyi, 1970
Chrysopelea paradisi	Sison et al., 1995
Cyclocorus lineatus alcalai	IR
Dendrelaphis caudolineatus terrificus	Leviton, 1970b
Dendrelaphis pictus pictus	Leviton, 1963c, 1970b
Elaphe erythrura psephenoura	Leviton, 1979
Gonyosoma oxycephala	IR[2]
Hologerrhum dermali	IR[2]
Lycodon aulicus capucinus	Leviton, 1965
Oligodon modestum	Sisoni et al., 1995
Psammodynastes pulverulentus	IR[2]
Pseudorabdion mcnamarae	Sisoni et al., 1995
Pseudorabdion oxycephalum	IR
Pseudorabdion talonuran	Brown et al., 1999
Tropidonophis negrosensis	Leviton, 1963c; Malnate and Underwood, 1988
Zaocys luzonensis	Ross et al., 1987
Calliophis calligaster gemianulis	Leviton 1963b, 1963c
Hydrophis belcheri	IR[1]
Hydrophis cyanocinctus	IR[1]
Hydrophis elegans	IR
Hydrophis inornatus	IR
Lapemis hardwickii	IR[1]
Laticauda colubrina	IR
Ramphotyphlops braminus	IR
Rhamphotyphlops cumingii	IR
Typhlops castanotus	Wynn and Leviton, 1993
Typhlops hypogius (= *T. ruber*?)	IR? (see McDiarmid et al., 1999)
Tropidolaemus cf *wagleri*	IR
Trimereserus flavomaculatus	Gaulke (in press)

as *Rana* cf *leytensis* are conspecific with specimens referred to this species from the Mindanao Aggregate Island Complex (Leyte, Samar, Bohol, and Mindanao).

Locality and specimens: . (Site 25) PNM 1114–15.

Limnonectes visayanus (Inger) (Fig. 19)

This large fanged frog is found in clear forest streams; it is known to hide in rock crevices during the day and call from rocks and stream banks above water at night (Alcala, 1962; Alcala and Brown, 1998). We found *L. visayanus* at low elevations on rocks in large rivers near Mt. Madja–as. This species may breed and lay eggs outside of water (Alcala, 1962).

Localities and specimens: (Site 2) PNM 1715–20; (Site 3) CAS 137592–95, 137590–91, 139164–66, USNM 305671–76; (Site 4) PNM 1613–20, 1623–27; (Site 6) CAS 137596–98; (Site 7) PNM 1799–800, 1828–31, 1836–39, 1845, 1855–60, 1865–77; (Site 11) CMNH 4894–98, 4899, PNM 1302–06, 2617–21; (Site 13) TNHC 56337; (Site 14) PNM 3710–12, 3732, 3764–68, 3805; (Site 25) 1085–92, 1133–38, 1140; (Site 28) CAS 124093–106, 124442–44, 124950–58; (Site 39) CAS 124121, 124293–97; (Site 44) CAS 125308–309, 125312; (Site 47) CAS 125302–307; (Site 50) USNM 78072–78.

Occidozyga laevis (Günther) (Fig. 20)

Occidozyga laevis is found in flooded fields in agricultural areas, in road–side ditches and open sewers, and in streams and rivers from lowlands to high elevation forested sites (Inger, 1954; Alcala, 1962; *pers. obs.*). On Negros this species has an altitudnal range of sea level to 1150 m (Alcala, 1962). Specimens are common in stream-side pools along larger rivers in forested areas near Mt. Madja-as and Mt. Baloy.

Localities and specimens: . (Site 1) PNM 1110–11, 1113, 1116–29, 1141, 1184–99; (Site 2) PNM 1116–29, 1690–1714, 1721–23, 1731, 1757–58; (Site 3) CAS 137586–88, 139148, 139167–68, USNM 305647–48; (Site 4) PNM 1600–02, 1611, 1621–22; (Site 6) CAS 137614–15, USNM 305649, 305650–54; (Site 7) PNM 1832–35, 1841–44, 1848–54, 1862–64, 1880; (Site 9) PNM 1156, 1165–68, 1170–71; (Site 10) PNM 1110–11, 1113; (Site 11) CMNH 4951–57, PNM 1329, 2655–61; (Site 12) PNM 1163–64; (Site 14) PNM 3730–31, 3782, 3804; (Site 22) CAS–SU 9813; (Site 23) CAS–SU 14224–25, 14373; (Site 24) FMNH 61478–81; (Site 25) PNM 1141; (Site 26) PNM 1160–62; (Site 27) CAS–SU 14049; (Site 28) CAS 124959–70, 124059–76, 124426, 124432–33, 124439; (Site 30) CAS–SU 14223; (Site 32) PNM 1172–73; (Site 38) CAS 132880, 132887–901, 134089–96; (Site 39) CAS 124171, 124190–91; (Site 40) USNM 339989; (Site 41) CAS 125001, 124177, 124184–85, 124194–96; (Site 42) CAS–SU 23946–49, 23952–58, 23961–63; (Site 44) CAS 125361–62; (Site 47) CAS 125311, 125344–59.

Platymantis corrugatus (Dumeril) (Fig. 21)

This widely distributed terrestrial frog inhabits the forest floor from sea level to above 1300 m (Alcala, 1986). On Mt. Madja-as we found *P. corrugatus* in leaf litter and in limestone crevices. This account and that of Gaulke (in press) appear to be the first published records of this species from Panay.

Localities and specimens: (Site 6) CAS 137616–19, 139149, 185494; (Site 11) CMNH 4960–63, 5118, PNM 2556–59; (Site 13) CMNH 3160–65; (Site 25) PNM 1103–06; (Site 28) CAS 124058.

Platymantis dorsalis (Dumeril)

This common forest frog is found in the detritus of the forest floor as well as in tree cavities and low tree ferns (Alcala, 1962; Alcala and Brown, 1998). Although recent studies (Brown et al., 1999) indicate the presence of numerous cryptic species in the *P. dorsalis* complex on Luzon (and we suspect that further new species await discovery in the Visayan islands), the calls of some *P. dorsalis* have been heard on Mt. Baloy and Mt. Madja-as are, at least superficially, similar to the short, whistling, ascending frequency sweep of true *P. dorsalis* from Luzon Island (Brown et al., 1997c). Thus, while we expect that more species in the *dorsalis* complex will soon be discovered in the Visayas, we can confidently assert that at least some Panay populations are indistinguishable from *P. dorsalis* of Luzon Island (Brown et al., 1997c; 1999). This account and that of Gaulke (in press) appear to be the first published records of this species from Panay.

Localities and specimens: . (Site 2) PNM 1734–56; (Site 6) CAS 137620–40, 137649–51, 139150–63, USNM 305655–70; (Site 11) CMNH 4964–98, 5206, PNM 2559, 2562–88; (Site 13) TNHC 56347–50; (Site 14) PNM 3713–19, 3729, 3733–45, 3756–62, 3772–74, 3783–85, 3788–89, 3791–96, 3830–31, 3857, 3860, 3862–65, 3882–83, 3886–88, 3893–95, 3906–08; (Site 25) PNM 1093–102; (Site 28) CAS 124419, 124428–31, 124440–41, 124689–91; (Site 39) CAS 124123–33, 124146–47; (Site 41) CAS 124041–42, 124122, 124186–89, 125014–19.

Platymantis negrosensis Brown, Alcala, Alcala, and Diesmos

This recently-described forest frog (Brown et al, 1997b) has only been documented from two sites on Panay but is also known from localities on the nearby island of Negros, from approximately 300 to 1625 m in elevation (Alcala, 1958; Alcala and Brown, 1957; Alcala, 1962). On that island, this species occupies arboreal microhabitats in primary forest (Brown and Alcala, 1961; Alcala, 1962; Brown et al, 1997b). We documented this island record for Panay (Sison et al., 1995; then recognized as *P. guentheri*) from specimens collected in forest on Mt. Baloy at about 950 m. This species is related to *P. luzonensis* but differs in characteristics of the advertisement call an external morphology (Alcala and Brown, 1998).

Localities and specimens: . (Site 13) CMNH 3166; (Site 14) PNM 3889.

Platymantis insulatus Brown and Alcala (Fig. 22)

A frog known from primary and secondary forest situated on karst limestone outcrops, this species was originally discovered (Brown and Alcala 1970b) on the forest floor and in the open mouths of small caves at low elevations (Alcala and Brown, 1998) on the island of Gigante South off Panay's northeast coast. A recent (June 2000) visit to the type locality by R. Brown and A. Alcala confirmed this species' persistence despite the complete removal of the original forest. The presence of an endemic species on such a small, land-bridge island is puzzling and suggests that it may still be (or at least, may have once been) present on eastern Panay. Unsurveyed limestone formations along the northeastern coast are the most promising possibility for locating this species on Panay.

Localities and specimens: . (Site 35) CAS 157235–39; (Site 36) CAS 137641–42; (Site 37) CAS 117440–41; 119967–69, MCZ A-72946.

Platymantis panayensis Brown, Brown and Alcala

Only recently described (Brown et al., 1997a) from our collections from Mt. Madja-as, this species is closely related to *P. hazelae* from Negros and occupies similar microhabitats in high elevation cloud forests. Taylor (1920:101) apparently had a specimen (collected by R. McGregor) of this species on hand during the description of *Philautus* (= *Platymantis*) *hazelae* and he considered it conspecific with the Negros population. On the basis of Taylor's (1920) account, Inger also (1954) included *P. hazelae* in his list of species from Panay .

We collected the majority of the type specimens of this species from leaf axils, leaves on shrubs, and the leaf litter on the forest floor. The call has not yet been formally described, but consists of a pure, ringing, tonal note with no frequency or amplitude modulation; it sounds to the human ear like the sound produced by the ringing of a small bell (1–2 notes/s).

Localities and specimens: (Site 6) CAS 137641–42; (Site 11) PNM 2314–18, 2495, 2589–90; CMNH 4113–15, 4116–20, 4868–69.

Platymantis sp. 1

Several immature specimens of a tiny, dark brown, tuberculate (11–15 mm SVL) species of *Platymantis* were taken at high elevations on Mt. Madja-as and on Mt. Baloy. They appear most similar to *Platymantis pygmaeus* of the Sierra Madre mountains of Luzon's east coast. Due to the fact that the available specimens are all sexually immature, we cannot recognize them taxonomically until further material and recordings of advertisements calls become available.

Localities and specimens: (Site 11) CMNH 8132 (Site 13) CMNH 3173–74, 3177.

Platymantis sp. 2

Two immature specimens of a diminutive, black, smooth-skinned (12–13 mm SVL) species of *Platymantis* were collected at 1450 m from under leaf litter. The small sample size and immaturity of the specimens necessitates that taxonomic recognition of the species must await the collection of further material.

Locality and specimens: (Site 11) CMNH 8133–34.

Platymantis sp. 3

This unidentified species is represented by a single, very large, black specimen with two dorsolateral light lines; it is appears possibly related to *P. pseudodorsalis* from Luzon (Brown et al., 1999).

Locality and specimen: (Site 6) CAS 185495.

Rana (= "*Fejervarya*") *cancrivora cancrivora* Gravenhorst

This common frog is found in swamps, ponds, flooded rice fields and ditches (Inger, 1954). It is found in almost any pool of water at low elevations (Alcala and Brown, 1998). Inger (1954) first reported it on Panay Island.

Localities and specimens: . (Site 1) PNM 1178–82; (Site 8) CAS 127893–95, 127899–904; (Site 9) PNM

1156; (Site 16) CAS 127509, 127559–81, 127611, 127678–79; (Site 17) CAS 127800; (Site 18) CAS 127801–803; (Site 19) PNM 2607–16; (Site 22) USNM 78862–902; (Site 23) CAS–SU 14259–60, 14452–79, 15486–514, USNM 77984–96, 77988–78042, 78048, 78062–65; (Site 24) FMNH 61398–402; (Site 26) PNM 1160–62; (Site 27) CAS–SU 14513–25; (Site 28) CAS 124262–71, 185665–69; (Site 30) CAS–SU 14252–57; (Site 34) CAS–SU 9762–63; (Site 36) CAS 124343; (Site 37) CAS 124564–76; (Site 38) CAS 132878–79; (Site 39) CAS 124135, 124175; (Site 40) USNM 339990, 340059–60; (Site 41) CAS 124178–79, 124320–28, 125020–28; (Site 42) CAS–SU 23966; (Site 44) CAS 125194–96; (Site 46) CAS 125183–93; (Site 47) CAS 125174–82; (Site 48) CAS 124791–92; (Site 50) USNM 78066–71.

Rana (= "*Hylarana*") *erythraea* (Schlegel) (Fig. 23)

This widely-distributed and common frog is believed to have been introduced to the Philippines (Diesmos, 1998; Alcala and Brown, 1998), originally on Negros (Inger, 1954; Alcala, 1962; Alcala and Brown, 1998). It's presence on Panay has been previously documented (Taylor, 1920; Inger, 1954). We found our specimens along the grassy boarders of flooded rice fields.

Localities and specimens: (Site 2) PNM 1725–26; (Site 3) CAS 137589; (Site 4) PNM 1603–10, 1612; (Site 7) PNM 1840; (Site 8) CAS 127891–92, 127905–912; (Site 10) PNM 1174–76; (Site 11) CMNH 4870, PNM 1309–28, 2591–92; (Site 14) PNM 3816; (Site 19) PNM 2622–54; (Site 22) CAS–SU 9744; (Site 23) CAS–SU 14537–47, USNM 77730–983, 78043–47, 78049–61; (Site 24) FMNH 61391–97, 61449—52; (Site 27) CAS–SU 14578–84; (Site 30) CAS–SU 11120–24, 14526–36, FMNH 40527; (Site 33) USNM 38650–54; (Site 38) CAS 132881–86, 134086–88; (Site 39) CAS 124209–212, 124214; (Site 44) CAS 125158–69; (Site 47) CAS 124143–57, 125310; (Site 50) USNM 77617–729, 78413–38.

Rana (= "*Chalcorana*") cf. *everetti* Boulenger

Species of the *Rana everetti* complex are found in and along streams from 300 to about 1300 m (Inger, 1954; Brown and Alcala, 1955; Alcala, 1962; Alcala, 1986; Brown et al., 2000). Our Mt. Baloy expedition in 1989 first recorded the presence of this frog on Panay (Sison et al., 1995). Negros populations (expected to be conspecific with those on Panay) are only found near water during breeding; this species has most often been collected in overhanging, streamside vegetation (Brown and Alcala, 1955; Alcala, 1967). As noted by Brown et al. (2000), the taxonomic status of the Visayan populations referred to *Rana everetti* is in need of further study.

Localities and specimens: . (Site 2) PNM 1732–33; (Site 14) PNM 3771, 3800–03, 3806–14, 3817–24, 3896, 3913; (Site 39) CAS 124213, 124215–16.

Rana (= "*Fejervarya*") *vittigera* Wiegmann (Fig. 24)

This species occurs in open, agricultural areas near sources of water (ponds, flooded rice fields). The distinctive, rapid honking call of this species can be heard in choruses of up to hundreds of individuals. This record appears to be the first published account of this species from Panay.

Localities and specimens: . (Site 11) CMNH 4871–72, PNM 2593–94; (Site 19) PNM 2596–606; (Site 40) USNM 339991; (Site 41) CAS 124197; (Site 46) CAS 125360.

Family Rhacophoridae

Polypedates leucomystax (Gravenhorst) (Fig. 25)

This common tree frog is widely distributed in Panay (Inger, 1954; Alcala, 1986) in agricultural areas, forest edges, and disturbed forests. It ranges from near sea level to 1000 m on Negros (Alcala. 1962) and was first documented on Panay by Inger (1954). Our specimens were collected in banana plantations and rice fields near the base of Mt. Madja-as and Mt. Baloy.

Localities and specimens: . (Site 1) PNM 1107–09, 1209–27; (Site 2) PNM 1729–30; (Site 6) CAS 137599; (Site 7) PNM 1797–98; (Site 11) CMNH 4997–98, PNM 2560–61; (Site 13) TNHC 56336, 56338; (Site 14) PNM 3763, 3799; (Site 16) CAS 127512–14, 127540–58, 127592–95, 127608–10, 127647–49, 127657, 127670–76, 127680–97, 127701; (Site 17) CAS 127721–26; (Site 18) CAS 127841; (Site 24) FMNH 61485; (Site 25) PNM 1107–09; (Site 28) CAS 124110–13, 124420, 124422–25, 124581; (Site 29) USNM 339992–93; (Site 30) CAS–SU 11113–16, 14764, FMNH 40569, 44263; (Site 37) CAS 124114, 125034–37; (Site 39) CAS 124158, 124192, 124204–07; (Site 40) USNM 339994; (Site 41) CAS 124176, 125031–32; (Site 42) CAS–SU 23950–51, 23959–60, 23964–65; (Site 47) CAS 125342–43.

Reptilia

Testudines

Bataguridae

Cuora amboinensis amboinensis (Daudin) (Fig. 26)

This common species is found throughout the Philippines (Gaulke and Fritz. 1998) and on Panay (Gaulke, in press) in low elevation forests, agricultural areas, and near streams and swampy areas; it is generally considered nocturnal (Alcala, 1986). We have collected this species in stream-side habitats at low elevations on Panay.

Localities and specimens: (Site 7) PNM 1888–89, 1891–95; (Site 11) CMNH 5500, 5501, 5502; PNM 1288, 5657–58; (Site 23) USNM 78103–04, 78746–49; (Site 41) CAS 153872; (Site 45) CAS 185507; (Site 50) USNM 78081–102.

Squamata (Lizards)

Agamidae

Bronchocela cristatella (Kuhl) and B. marmorata (Gray)

These arboreal lizards (Alcala, 1986) are found from lowland cultivated areas to lower midmontane primary and secondary forests; they are most often encountered sleeping at night in stream-side vegetation. No suitable taxonomic reference is available for Philippine *Bronchocela* and so the true identities of Panay specimens referred to *B. cristatella* and *B. marmorata* are uncertain. There is little consensus regarding the identity of *Bronchocela* throughout the Visayas. Although specimens from Negros and Panay key out to earlier descriptions of both *Bronchocela marmorata* and *B. cristatella* (Taylor, 1922c; Alcala, 1986), both "species" appear to be highly variable and diagnostic characters vary ontogenetically. We consider it unlikely that two independent lineages occur in sympatry on Panay and, at present, we hold in abeyance the identity of these populations until a thorough taxonomic revision is available.

Localities and specimens: . (Site 6) CAS 137605; (Site 22) CAS–SU 10948; (Site 23) USNM 77133–38, 78105–107; (Site 41) CAS 124333; (Site 47) CAS 125337–38.

Draco spilopterus (Weigmann) (Figs 27, 28)

This species is common at lower to mid-montane elevations and often is found in coconut groves and forest edges (Alcala, 1986; McGuire and Alcala, 2000). *Draco spilopterus* is the only *Draco* species currently recognized from the Visayan and Luzon aggregate island complexes, despite biogeographic and morphological evidence suggesting that Luzon and Visayan populations constitute independent evolutionary lineages (Taylor, 1922c; Heaney, 1985, 1986; McGuire and Alcala, 2000). *Draco spilopterus* may warrant further taxonomic attention once biochemical studies of species boundaries become available (Taylor, 1922c; McGuire and Alcala, 2000).

Localities and specimens: . (Site 3) CAS 137578, 185504; (Site 4) PNM 1628–38; (Site 6) CAS 137608–609, 185505; (Site 7) PNM 1759–79; (Site 8) CAS 127886, 127916, 127961, 128031; (Site 11) PNM 1275–82, 2720–21; (Site 14) PNM 3769–70, 3878; (Site 18) CAS 127851–52; (Site 19) TNHC 58465–67, 58471–80, 58482–90, 58850; (Site 43) CAS 39686; (Site 44) CAS 125295, USNM 38990–96; (Site 47) CAS 125277–94.

Hydrosaurus pustulatus (Eschscholtz) (Figs. 29, 30)

The Mt. Madja-as specimens were collected in overhanging stream-side vegetation. On Mt. Baloy we also collected a specimen in similar riparian habitats. These large omnivorous agamids can be found on trees and shrub-layer vegetation, overhanging streams and rivers (Alcala, 1986). The taxonomy of Philippine *Hydrosaurus* is in need further taxonomic studies.

Localities and specimens: (Site 11) CMNH 5043; (Site 13) TNHC 56762; (Site 22) USNM 77091–103, 85073–74; (Site 44) CAS 125336, USNM 38988–89; (Site 50) 77104–28, 78168–87.

Gonocephalus sp.

This genus was reported as an island record for Panay from site 2 by Sison, et al. (1995). The name *G. sophiae* has been applied to Negros populations (Taylor, 1922c; Alcala, 1986) and we might expect that if Negros populations are indeed *G. sophiae* (and this name applies to a distinct lineage that is independent from *G. semperi*), specimens from Panay might be referable to this species as well (see Gaulke, in press). At present, no suitable taxonomic reference exists, and species boundaries are unclear. Due to this fact, we do not apply a specific epithet to this population. Philippine populations of the genus *Gonocephalus* are greatly in need of taxonomic review.

Localities and specimens: (Site 2) PNM 1130–32; (Site 14) PNM 3858.

Gekkonidae

Cosymbotus platyurus (Schneider)

We found specimens of this common house gecko species in both the city and in agricultural areas; they are widely distributed on Panay (Brown and Alcala, 1978) and are usually encountered under lights.

Localities and specimens: (Site 7) PNM 1803, 1815–16; (Site 8) CAS 128020; (Site 11) CMNH 5137, PNM 1261–74; (Site 19) CMNH 5089–96, 5098–104, PNM 2722–36; (Site 22) USNM 78776–832, 103480; (Site 23) USNM 77144–57, 339998–340010; CAS–SU 9613; (Site 26) PNM 1234–44, 1247, 1249; (Site 29) USNM 339995–97; (Site 34) CAS–SU 9612, 12021; (Site 40) USNM 34011–12; (Site 50) FMNH 41302.

Cyrtodactylus annulatus (Taylor) (Fig. 32)

Brown and Alcala (1978) and Alcala (1986) report this species in forested areas ranging from sea level to 1200 m on the nearby land-bridge islands of Negros, Cebu, and Inampulugan (Site 42) and its presence on Panay is not surprising. Nevertheless, this report and that of Gaulke (in press) appear to be the first records of this species from Panay. Brown and Alcala (1978) reported that this species has been collected on the forest floor, from under logs, beneath bark, and on the trunks of trees. We found Panay specimens in secondary forest on root masses of trees protruding through eroding banks along a large river at the base of Mt. Madja-as. Predation on this species by flying snakes (*Chrysopelea paradisi*) was observed in these same microhabitats.

Locality and specimens: (Site 28) CAS 124614–15, 124768–78 (Site 42) CAS–SU 28009–10, 28013–14, 28016–19, 28031, 28036–41, 28044–46,28050–60.

Cyrtodactylus philippinicus (Steindachner) (Fig. 33)

This species of *Cyrtodactylus* is found in a variety of habitats in the forest, particularly in rotting logs (Brown and Alcala, 1978; Alcala, 1986) and has been collected from sea level to nearly 1200 m (Brown and Alcala, 1978). In the Visayas, this species also has been collected on the nearby land-bridge islands of Negros, Pan de Azucar, and Boracay but never before on Panay. The specimens from Mt. Madja-as were collected in primary forest, during the day, under loose tree bark.

Localities and specimens: . (Site 6) CAS 137607; USNM 496868; (Site 8) CAS 127883; (Site 11) CMNH 5125–28, PNM 2751–53; (Site 13) TNHC 56339; (Site 18) 127864, 127869; (Site 28) CAS 124783–84; (Site 41) CAS 124046, 124780–82.

Gehyra mutilata (Weigmann) (Fig. 34)

This common and widely-distributed lizard is consistently found not only around human habitation (in darker areas, away from lights), but also in gardens and forested areas on trees (Brown and Alcala, 1978; Alcala, 1986).

Localities and specimens: (Site 2) PNM 1682–86; (Site 3) CAS 137579; (Site 4) PNM 1649–53; (Site 7) PNM 1824; (Site 8) CAS 127888, 127922–29, 127948–52, 127964, 127975–76, 127999–128000, 128054–55; (Site 11) CMNH 5105–16, 5198, PNM 1250–58, 2737–46; (Site 16) CAS 127504, 127607; (Site 18) CAS 127804, 127866; (Site 19) PNM 2737–46; (Site 23) USNM 77158, 78834–35; (Site 26) PNM 1245–49; (Site 28) CAS 124434–36, 124616–19; (Site 29) USNM 340013–14; (Site 37) CAS 125029; (Site 39) CAS 124118–120, 124161–170; (Site 40) USNM 340015; (Site 41) CAS 124180–83; (Site 42) CAS-SU 28012, 28047–49; (Site 44) CAS 124505–510; (Site 46) CAS 124687–88; (Site 47) CAS 124682–86, 125129–31; (Site 48) CAS 124511–12; (Site 50) FMNH 41383.

Gekko gecko (Linnaeus)

This common species is found around human habitation and in forest adjacent to disturbed areas. We collected specimens in secondary forest near the base of Mt. Madja-as.

Localities and specimens: (Site 1) PNM 1056–63; (Site 2) PNM 2667; (Site 7) PNM 1062–1063, 1792–96; (Site 8) CAS 128004; (Site 11) CMNH 5018–25, PNM 1282, 1330, 2662–69; (Site 16) CAS 127582; (Site 17) CAS 127745; (Site 19) PNM 2665; (Site 23) CAS–SU 9585–88; USNM 77142–43, 340018–19; (Site 28) CAS 124979; (Site 29) USNM 340016–17; (Site 31) PNM 1143; (Site 35) CAS 124393, 124318, 124866–75; (Site 37) CAS 124315–17, 124929–49; (Site 39) CAS 124389–92; (Site 41) CAS 124319, 124580; (Site 42) CAS-SU 27929; (Site 44) CAS 125251; (Site 46) CAS 125249–50; (Site 47) CAS 125247–48; (Site 49) CAS–SU 9589; (Site 50) FMNH 41377–81, 41376.

Gekko gigante Brown and Alcala (Figs. 35, 36)

Gekko gigante was described by Brown and Alcala (1978) from the tiny land-bridge islands of Gigante

North and Gigante South, off the northeast coast of Panay (Fig. 2). This species has not been studied since its 1968 discovery until a recent visit to the type locality by RMB and A. Alcala in June 2000. We found *G. gigante* in small sea-side caves in karst limestone outcrops along the south coast of Gigante South. The northeast coast is the best place to survey for this species on Panay if suitable limestone habitat can be located.

Localities and specimens: (Site 35) CAS 124318, 124866–75 (Site 37) CAS 124315–17, 124929–49.

Gekko mindorensis Taylor (Fig. 37)

Brown and Alcala (1978), and Alcala (1986) report that individuals of this species are common on walls of caves, on tree trunks, and in leaves around the buttresses of trees. Elsewhere in the Visayas this species has been reported from Negros, Cebu, and Caluya (Brown and Alcala, 1978). We have caught this species on cement walls, abandoned buildings in the forest, in road-cut culverts, and on large dead tree trunks and stumps. Sison et al. (1995) reported this as an island record from Site 29. The taxonomic distinctiveness of this species requires verification; recent data suggest the widespread *G. mindorensis* may be conspecific with *G. kikuchii* from Taiwan (Crombie and Ota, unpublished data; see also comment by Taylor, 1922c).

Localities and specimens: (Site 8) CAS 127882, 127884–85, 128021; (Site 11) One uncataloged specimen, deposited in PNM; (Site 16) CAS 127700; (Site 18) CAS 127817; (Site 28) CAS 124767; (Site 29) PNM 2500; (Site 39) CAS 124136.

Hemidactylus frenatus Schlegel *in* Dumeril and Bibron

This common house gecko is widespread on Panay and often is associated with *Cosymbotus platyurus* (Alcala, 1986) in well lighted areas in human habitation. We collected several specimens near the base of Mt. Madja-as on walls of houses in agricultural areas.

Localities and specimens: (Site 3) CAS 137580, USNM 496869–70; (Site 7) PNM 1801–02, 1804–14; (Site 8) CAS 127878–81, 127897, 127913–14, 127930–45, 127953–58, 127963, 127977–78, 128001–03, 128022–26, 128034–35, 128056–57, 136742–44; (Site 11) CMNH 5148–54, PNM 1259–60, 1646–48, 2771–76; (Site 16) CAS 127505–07, 127515–16, 127583, 127615–16, 127642–46, 127652–56, 127658–59, 127699; (Site 17) CAS 127710–20, 127727–44, 127748–65, 127795–99, 136741; (Site 18) CAS 127805–14, 127818–26, 127829–40, 127848–50, 127865; (Site 19) CMNH 5129–36, 5139–47, PNM 2754–70; (Site 23) USNM 78833, 78836–39; (Site 26) PNM 1245–1246; (Site 28) CAS 124081–92, 124427, 124663, 125002–12; (Site 29) USNM 340021–27; (Site 33) USNM 340028–32; (Site 35) CAS 124363, 124504; (Site 37) 124364–72, 124357–62, 124582–610, 124662; (Site 39) CAS 124137–43, 124217–42; (Site 40) 340034–41; (Site 41) CAS 124373–85, 124664–81, 125013; (Site 42) CAS–SU 28007–08, 28011, 28021, 28034–35, 28042–43; (Site 44) CAS 124466, 124526–58 [Nadulao Island]; (Site 46) CAS 124458–65, 125315–30, 124736–66; (Site 47) CAS 124448–57, 125128, 125313–14; (Site 50) FMNH 41384–86.

Hemidactylus stejnegeri Ota and Hikida

Previously referred to *H. garnoti* (Brown and Alcala, 1978), the status of Philippine populations was clarified by Ota and Hikida (1989) and Ota et al. (1993). Sison et al. (1995) reported this species as an island record for Panay.

Locality and specimen: (Site 25) CMNH 3225.

Hemiphyllodactylus insularis Taylor

While Brown and Alcala (1978) referred Philippine (and Panay Island) populations of *Hemiphyllodactylus* to *H. typus*, collections in USNM contain males and are not, therefore, the widespread unisexual *H. typus*, but probably are better referred to Taylor's *H. insularis* (R. Crombie, personal communication.).

Localities and specimens: . (Site 3) CAS 137581–83; (Site 8) CAS 127889, 127965–71; (Site 18) CAS 127855–57.

Lepidodactylus lugubris (Dumeril and Bibron)

This lowland gecko is common in patchy distributions and found in leaf axils, under bark, in tree holes, in coconut groves, and associated with large rocks in coastal areas (Brown and Alcala, 1978; Alcala, 1986). Though reported from Negros, Cebu, Inampulugan, Boracay, Gigante, and Pan de Azucar (Brown and Alcala, 1978), this species has not yet been reported from Panay.

Localities and specimens: (Site 8) CAS 127947, 127959, 127979, 127982–87, 127989, 128005–07, 128010, 128012–14, 128017, 128043–44, 128046–50, 128059, 154716; (Site 28) CAS 124579; (Site 37) CAS 124200, 125030, 125033; (Site 39) CAS 124116–17; (Site 41) CAS 124981–125000; (Site 42) CAS–SU 28015, 28061; (Site 44) CAS 124561–63; (Site 46) CAS 124492.

Lepidodactylus planicaudus Stejneger

Alcala and Brown (1978) recorded this species in coconut trees, mangroves, and in fern axils; they have also been taken on tree trunks in forests from sea level to 700 m. Elsewhere in the Visayan Aggregate Island Complex it is known from Cebu, Guimaras, Caluya, Masbate and Boracay (Brown and Alcala, 1978).

Localities and specimens: (Site 3) CAS 139939; (Site 8) CAS 127921, 127980–81, 127988, 127990, 128008–09, 128011, 128015–16, 128018–19, 128045, 128051–53; (Site 16) CAS 127698; (Site 17) CAS 127709; (Site 39) CAS 124115, 124134; (Site 46) CAS 124823–26.

Scincidae

Brachymeles boulengeri taylori Brown (Figs. 38, 39)

Usually encountered in agricultural areas (especially coconut plantations) adjacent to forest, this species most often is collected from its preferred microhabitat, inside rotting coconut logs. It has also been collected in mature and secondary forest, from sea level to 1200 m on numerous islands in the Visayas (Brown and Alcala, 1980) but this is the first record from Panay.

Localities and specimens: (Site 1) PNM 1148; (Site 25) PNM 1148; (Site 39) CAS 124157; (Site 41) CAS 124044 (Site 42) CAS 27930–31, 27946–51, 27953, 27973–84, 27987–93.

Brachymeles talinis Brown

This skink occupies decaying vegetation and humus on the floor of primary and, occasionally, secondary forest (Brown and Alcala, 1980; Alcala, 1986). Alcala and Brown (1980) reported its elevational range from sea level to approximately 1200 m.

Localities and specimens: (Site 6) 137603; (Site 8) CAS 127870–75, 127962, 128029–30, 154689; (Site 14) PNM 3852, 3856, 3859, 3909–10; (Site 16) CAS 127517–39, 127584–90, 127606, 127663–68; (Site 28) 154692, 200522–31; (Site 39) CAS 124148, 200521; (Site 42) CAS–SU 27972, 27996–97; (Site 50) CAS 137603.

Brachymeles tridactylus Brown (Fig. 40)

This species has been collected under logs, humus, and other debris in forested regions from sea level to approximately 900 m (Brown and Alcala, 1980; Alcala, 1986). On Mt. Madja-as we found them under logs in well-regenerated second growth forest below 200 m.

Localities and specimens: (Site 3) CAS 137566–75; (Site 6) CAS 137602, 137604; (Site 8) CAS 127876–77, 127915, 127974, 128027–28, 128037–42; (Site 11) PNM 5514–15; (Site 42) CAS–SU 27950, 27952, 27985–86, 28456.

Dasia grisea (Gray)

In the Philippines, this species has been recorded from the islands of Mindoro, Luzon, and Marinduque (Brown and Alcala, 1980). Its inclusion in this paper is based on a single record from Semirara Island, a small island south of Mindoro that is included in the political boundary of Antique province but is on the land-bridge to Mindoro. We do not expect this species to be discovered on Panay and we do not regard it as a Visayan Aggregate Island complex resident.

Locality and specimen: (Site 18) CAS 134218.

Dasia semicincta (Peters)

A large lowland species, previously reported only from Mindanao in the Philippines (Brown and Alcala, 1980; Alcala, 1986). Outside of the Philippines *D. semicincta* is known from Borneo (Brown and Alcala, 1980). This is the first record of this species from Panay; it also is a substantial range extension in need of verification.

Locality and specimen: (Site 23) USNM 78840.

Emoia atrocostata (Lesson)

This species of skink is common in mangroves and can be found active on tree trunks, in tree holes, and in rock crevices (Alcala and Brown, 1967; Brown and Alcala, 1980; Alcala, 1986). Taylor (1922c) reported that this species swims in brackish water, burrows in sand, and feeds on small crabs. On Panay and Negros, mangrove forests have nearly all been cleared, possibly rendering this species rare in recent collections.

Localities and specimens: (Site 16) CAS 127638–39; (Site 18) CAS 127842–45; (Site 22) CAS–SU 13585; (Site 23) USNM 77139, 78411, 78841, 80934; (Site 37) CAS 125040; (Site 41) CAS 124329–32, 124620–24; (Site 42) CAS-SU 27920; (Site 47) CAS 125335; (Site 50) USNM 77141.

Lamprolepis smaragdina philippinica (Mertens)

This skink is common in coconut groves and gardens and a variety of natural vegetation types (Alcala, 1986). Near Mt. Madja-as and Mt. Baloy we observed them on coconut trunks at low elevations.

Localities and specimens: (Site 4) PNM 1639; (Site 7) PNM 1780, 1782, 1786; (Site 8) CAS 127887,

127917–20, 127946, 127991–98, 128058, 128060–61; (Site 11) CMNH 5038–40, PNM 1283, 2681–82; (Site 14) PNM 3798; (Site 16) CAS 127508, 127612–14, 127640–41, 127669; (Site 17) CAS 127747, 127794; (Site 18) CAS 127853–54; (Site 19) TNHC 56472–73; (Site 28) 124053–57; (Site 35) CAS 124198, 124711–13; (Site 39) CAS 124201–02; (Site 40) USNM 340061; (Site 42) CAS–SU 27954–62, 27969; (Site 44) CAS 125301; (Site 46) 125298–300; (Site 47) CAS 124447, 125296–97.

Lipinia pulchella taylori (Brown and Alcala)

This widely distributed arboreal skink had not been reported from Panay prior to our visits to Mt. Majdaas. Previously, *L. p. taylori* had only been known from Negros (Brown and Alcala, 1980). Brown et al. (1996; 2000) have collected specimens from Luzon that key out to this subspecies, potentially indicating the need for a review of Brown and Alcala's (1980) taxonomy of this species. This is a new island record for Panay.

Localities and specimens: (Site 11) CMNH 5083; (Site 25) PNM 1156.

Mabuya indeprensa Brown and Alcala

Sison et al. (1995) reported this species as an island record, collected at about 200 m on Mt. Baloy. Well known from forested, montane habitats on Negros and Cebu (Brown and Alcala, 1980), this species is found in leaf litter, stumps and fallen logs, and around tree buttresses.

Localities and specimens: (Site 1) PNM 1149; (Site 9) PNM 1153–55; (Site 11) CMNH 5119–22, 5199–202, PNM 2747–49, 5511–13; (Site 13) one uncataloged specimen deposited in PNM; (Site 16) CAS 127596–97, 127599, 127601–02, 127604–05; (Site 18) CAS 127863; (Site 25) CMNH 3247, PNM 1151–1152.

Mabuya multicarinata borealis Brown and Alcala (Fig. 41)

This subspecies commonly is found under tree bark, logs and piles of vegetation (Brown and Alcala, 1980; Alcala, 1986); in the Visayas it has been collected on Negros, Caluya, Semirara, Gigante, Pan de Azucar, and Cebu, but this is the first record from Panay. Brown and Alcala (1980) reported finding one specimen as high as 1500 m on Luzon island.

Localities and specimens: . (Site 2) PNM 1657–60, 1668–80; (Site 6) USNM 496871; (Site 16) CAS 127598, 127600, 127603, 127650–51; (Site 18) CAS 127862. 127867–68; (Site 28) CAS 124107–109, 124971–78; (Site 35) CAS 124493–97; (Site 36) CAS 124199, 125039; (Site 37) CAS 125038; (Site 41) CAS 124050.

Mabuya multifasciata (Kuhl)

This species was found in a variety of habitats from beaches and low elevation agricultural areas, to disturbed forest adjacent to primary forest on Mt. Madjaas. Though known to occur throughout the Philippines, in the Visayas, this species has only been reported from Negros (Brown and Alcala, 1980); this is the first published account from Panay.

Localities and specimens: (Site 2) PNM 1661–65; (Site 3) CAS 137585, USNM 496872; (Site 4) PNM 1640–45, 1655–56; (Site 6) CAS 137610–12, 139147; (Site 7) 1781, 1783; (Site 11) CMNH 5203–04, PNM 5510; (Site 14) PNM 3845–46, 3853; (Site 22) CAS–SU 13632; (Site 25) PNM 1149–55; (Site 42) CAS–SU 27968, 27971, 27998; (Site 44) CAS 125264–66; (Site 46) CAS 125334; (Site 47) CAS 125262–63, 125333; (Site 50) FMNH 41389–404.

Parvoscincus sisoni Ferner, Brown and Greer

All specimens of this recently-described species were collected during the day from beneath loose soil and leaf litter in the forest between 900 and 1125 m (Ferner et al., 1997). At present, this species is known only from Mt. Madja-as; the only other member of the genus is from Palawan Island (*P. palawanensis*).

Locality and specimens: (Site 11) CMNH 3797–99, PNM 2308–10.

Sphenomorphus arborens Taylor

This forest species is found under logs and leaves and occasionally on buttresses at the base of tree trunks (Brown and Alcala, 1980; Alcala, 1986). Our specimens were collected in primary forest between 1400 and 1600 m in pit-fall traps.

Localities and specimens: . (Site 6) CAS 137644; (Site 11) CMNH 5062–74, PNM 2684–710; (Site 14) PNM 3720, 3746–48, 3753, 3867–69, 3871, 3875, 3898, 3901–03; (Site 41) CAS 124048–49.

Sphenomorphus coxi divergens Taylor

This species is often found at the forest edge and in forest gaps. It is widely-distributed in the archipelago (Brown and Alcala, 1980; Alcala, 1986). *Sphenomorphus coxi divergens* previously has been reported from Luzon, Marinduque, and Mindoro but not the Visayas (Brown and Alcala, 1980). This is the first published record of a specimen from Panay.

Locality and specimens: (Site 11) CMNH 5123, PNM 2750.

Sphenomorphus cumingi (Gray)

This large forest species is found around fallen logs and tree buttresses and is believed to be limited to low to medium elevations (Brown and Alcala, 1980; Alcala, 1986). *Sphenomorphus cumingi* previously has been reported from islands in the Luzon and Mindanao aggregate island complexes; this is the first published record of a specimen from Panay.

Locality and specimen: (Site 28) CAS 124779.

Sphenomorphus jagori grandis Taylor (Fig. 42)

This large skink is found under rotting logs, in sun spots in forested and disturbed areas, and along streams (Brown and Alcala, 1980; Alcala, 1986).

Localities and specimens: . (Site 6) 137645–48; (Site 14) PNM 3724–5, 3755; (Site 16) CAS 127660–62, 127677; (Site 28) CAS 125267–76, 154659–68; (Site 37) CAS 124835, 185508; (Site 41) CAS 185509–516.

Sphenomorphus steerei Stejneger

We found this species on Mt. Madja-as in leaf litter in montane forest. Brown and Alcala (1980) report that this species is common in leaf litter of primary forest and in secondary growth.

Localities and specimens: (Site 3) CAS 137600–601, 139169–70, USNM 496873–74; (Site 11) CMNH 5026–37, PNM 2670–80; (Site 14) PNM 3708–09, 3721–23, 3726, 3749–52, 3754, 3775–81, 3786–87, 3797, 3826–29, 3836–42, 3847–51, 3854–55, 3861, 3870, 3872–74, 3876–77, 3879–81, 3890–92, 3914; (Site 25) PNM 1159; (Site 28) CAS 124437–38, 124577–78; (Site 36) CAS 124830; (Site 37) CAS 124827–29, 124839; (Site 39) CAS 125091; (Site 47) CAS 124625–61, 125064, 125090.

Tropidophorus grayi Günther (Fig. 43)

Sison et al.'s (1995) Mt. Baloy specimen was the first record of this species from Panay. We also found a specimen at the base of Mt. Madja-as underneath a rock on the edge of a small stream in second growth forest.

Localities and specimens: (Site 11) CMNH 5117; (Site 13) One uncataloged specimen deposited in PNM.

Varanidae

Varanus salvator nuchalis (Günther) (Figs. 44, 45)

This monitor lizard is found in agricultural and disturbed areas, mangrove swamps, and forested areas from sea level to about 1200 m (Alcala, 1986; Gaulke, 1991a, 1991b, 1992). On Mt. Madja-as we collected one specimen during the day in second growth forest where it was active near a small stream.

Localities and specimens: (Site 1) PNM 1142; (Site 11) PNM 5660; (Site 22) CAS 11018; (Site 31) PNM 1142; (Site 37) CAS 124879; (Site 44) CAS 124881; (Site 47) CAS 124880; (Site 50) USNM 77129–32, 80115–19; FMNH 41417–18.

Squamata (Snakes)

Acrochordidae

Acrochordus granulatus (Schneider)

Found in mangroves and at river mouths, this species feeds exclusively on fish and is widely distributed and common (Alcala, 1986). We are not aware of other published accounts of this species from Panay.

Locality and specimens: (Site 23) USNM 78412, 78744–45, 78906, CAS–SU 8695, 8769.

Boidae

Python reticulatus (Schneider) (Fig. 46)

While this snake is considered widely distributed and common in the tropical rain forests as well as near human habitation (Alcala, 1986), only one specimen has been collected on Panay Island (Leviton, 1963c; see also Gaulke, in press).

Locality and specimen: (Site 44) CAS 124916.

Colubridae

Ahaetulla prasina preocularis (Taylor) (Fig. 47)

This snake may be found in low trees and shrubs from sea level to about 800 m on Panay (Leviton, 1963c, 1968; Alcala, 1986). The specimens from Mt. Madja-as were collected from vegetation overhanging a small stream at low elevation.

Localities and specimens: (Site 2) PNM 1689; (Site 7) PNM 1787; (Site 11) CMNH 5084–85, PNM 2716; (Site 14) PNM 3825; (Site 29) USNM 340042; (Site 44) CAS 125339; (Site 50) FMNH 41108.

Boiga angulata (Peters)

We found our specimen in a coconut tree in a clearing adjacent to virgin forest at 900 m on Mt. Madja-as. While this species is known from Negros (Leviton, 1970a), until this report and that of Gaulke (in press) it has never been recorded on Panay.

Locality and specimen: (Site 11) CMNH 5504

Boiga cf *cynodon* (Cuvier *in* F. Boie)

This species has been found in forested areas at low altitudes on Palawan, Mindanao, and Luzon (Leviton, 1963c, 1970a; Alcala, 1986) but previously it has not been reported in the Visayas (see also Gaulke, in press).

Locality and specimen: (Site 41) CAS 125173.

Boiga cf. *dendrophila* (Boie)

Mangrove snakes usually are found in branches of low trees and bushes in forested areas (Leviton 1968; Alcala, 1986) at low elevations. This is the first record of a species in this complex from Panay.

Localities and specimens: (Site 28) CAS 124388; (Site 39) CAS 124386–87.

Calamaria geravaisi Dumeril and Bibron

A burrowing snake, this species is commonly found in the humus under rotting logs and feeds on earthworms (Leviton, 1963c; Inger and Marx, 1965; Alcala, 1986). On Mt. Madja-as we found specimens under rotten logs and large flat rocks.

Localities and specimens: (Site 2) PNM 1087; (Site 11) CMNH 5081–82, PNM 2714–15; (Site 23) CAS–SU 15953–57, 15962–65; (Site 44) CAS 124612.

Cerberus rynchops (Schneider)

This aquatic snake has been collected in brackish swamps, mangroves, fish ponds, and river estuaries in coastal areas (Gyi, 1970; Alcala, 1986)

Localities and specimens: (Site 1) PNM 1053–55, 1077–83; (Site 20) CAS–SU 13079; (Site 22) CAS–SU 8696–97, 8719; CAS–SU 12380, CM R2423, R2426; (Site 23) USNM 77159–478, 78907–19; (Site 40) 340043; (Site 50) FMNH 41115–17.

Chrysopelea paradisi Boie

This species was not known from Panay (Leviton, 1963, 1964a) until Sison, et al. (1995) reported it as an island record from Site 1. On Mt. Madja-as we found this arboreal snake during the day in root masses overhanging a river bank; one specimen was preying on a *Cyrtodactylus annulatus* when captured. We have also observed this species in coconut groves at sea level near the town of San José (site 19).

Localities and specimens: (Site 1) PNM 1050; (Site 8) CAS 128032; (Site 11) CMNH 5041–5042, PNM 2683; (Site 19 TMM 56474; (Site 27) CAS 185–672; (Site 36) CAS 125172; (Site 46) CAS 125331–32.

Cyclocorus lineatus alcalai Leviton

We found our specimens in habitats ranging from disturbed second growth at sea level to first growth forested riparian sites at 1400 m. At the time of its description (Leviton, 1967), this subspecies was known only from the nearby islands of Negros and Cebu (Fig. 2). This is the first published account of this species from Panay.

Localities and specimens: (Site 1) PNM 1047, 1065; (Site 2) PNM 1065, 1688; (Site 3) CAS 137576; (Site 6) CAS 137606; (Site 11) CMNH 5086–87, PNM 2717–18; (Site 14) 3884–85, 3912; (Site 16) CAS 127702, 127706; (Site 28) CAS 124051–52, 124421; (Site 37) CAS 125171; (Site 47) CAS 124445.

Dendrelaphis caudolineatus terrificus (Peters)

This subspecies is known from Panay and Negros and usually is found in forested and cultivated areas in or along swamps and streams (Leviton, 1970b; Alcala, 1986). Sison et al. (1995) reported this as an island record from 200 m on Mt. Baloy. The specimen from Mt. Madja-as was sleeping in bushes near a river when captured.

Localities and specimens: (Site 4) CAS 1654; (Site 8) CAS 127896, 128033; (Site 11) CMNH 5080; (Site 13) CMNH 3254; (Site 16) CAS 127703–705, 127707–708; (Site 18) CAS 127828, 127847, 127859; (Site 28) CAS 125170; (Site 39) CAS 124203, 185673–74; (Site 42) CAS-SU 28004; (Site 50) FMNH 41093–96.

Dendrelaphis pictus pictus (Gmelin) (Fig. 48)

This common snake is arboreal and usually found near streams, in vegetation surrounding flooded rice fields, and in swampy areas (Leviton, 1963c, 1970b; Alcala, 1986). The Mt. Madja-as specimens were collected at night where they slept in stream-side vegetation.

Localities and specimens: (Site 1) PNM 1049, 1071; (Site 3) CAS 137577; (Site 7) PNM 1788–90; (Site 9) PNM 1071; (Site 11) CMNH 5078–79, PNM 2713; (Site 14) PNM 3843–44; (Site 22) CAS–SU 8660–70, 8718, 14932, 14936–37, CMNH 2408–13,

CM R2226, R2408–13; (Site 23) CAS–SU 8698–99, 8708–710; USNM 77419–591, 340044–51; (Site 30) CAS–SU 14931 ; (Site 38) CAS 200256; (Site 44) CAS 125255–61; (Site 46) CAS 125254; (Site 47) CAS 125252–53; (Site 48) CAS 124725; (Site 50) FMNH 4109–104, 41106, USNM 77592–609.

Elaphe erythrura psephenoura Leviton

This is a common lowland snake, often found near human habitations (Leviton, 1979; Alcala, 1986). On Mt. Madja-as we collected one specimen from the forest floor where it was active at midday.

Localities and specimens: (Site 1) PNM 1048, 1051; (Site 11) PNM 5662; (Site 22) CAS–SU 12389, 13212–13; (Site 23) USNM 340052; (Site 30) CAS–SU 13217; (Site 38) CAS 131700; (Site 42) CAS-SU 28001; (Site 47) CAS 125141–42, 125340.

Gonyosoma oxycephala (Reinwardt *in* F. Boie)

This is an arboreal snake that is found in disturbed and primary forests (Alcala, 1986). On Mt. Madja-as we collected one specimen that was active at mid day in a tree above a large river (4 m from the ground). This record, and that of Gaulke (in press) are the first published accounts of this species from Panay.

Localities and specimens: (Site 1) PNM 1084; (Site 9) PNM 1084; (Site 11) CMNH 5503; PNM 5659.

Hologerrhum dermali Brown, Leviton, Ferner, and Sison

We first collected this newly-described species (Brown et al., this issue) between 1030 and 1510 m in climax forest on Mt. Madja-as. Specimens were collected in a dry stream bed and in leaf litter on the forest floor 30 m from a large river. One specimen from the Municipality of San Remegio was collected at approximately 700 m above sea level. Recent survey work in NW Panay suggests that this species also occurs in forested areas at lower elevations (Gaulke, in press).

Localities and specimens: (Site 11) CMNH 5075, PNM 2711 (14) PNM 3704.

Lycodon aulicus capucinus (H. Boie *in* F. Boie) (Fig. 49)

This common, widespread, nocturnal snake is often found in gardens, agricultural areas, and around houses (Leviton, 1965; Alcala, 1986). Our specimens were collected near rice fields away from forested areas.

Localities and specimens: (Site 1) PNM 1072–75; (Site 3) CAS 137584; (Site 8) CAS 127960; (Site 12) PNM 1072; (Site 13) PNM 1380; (Site 22) CAS–SU 8671, 8700–01, CMNH 2443, CM R2443; (Site 23) USNM 77616, 340053; (Site 26) PNM 1073–75; (Site 47) CAS 125341.

Oligodon modestum (Günther)

This species is found under rotting logs and forest floor debris; it is known from sea level to 400 m (Alcala, 1986). In the Visayas, this species was only known from Negros (Leviton, 1963a) before Sison et al. (1995) first reported it on Panay.

Localities and specimens: (Site 1) PNM 1066; (Site 2) PNM 1067; (Site 14) PNM 3790, 3866.

Psammodynastes pulverulentus (H. Boie *in* F. Boie)

Leviton (1963c; 1983) and Alcala (1986) report this snake as common up to elevations of 1000 m or more in moist forests on Negros Island; Leviton's (1963c) listing of this species from Panay was not repeated in his 1983 review of the genus in the Philippines and no specimens were reported from Panay in the later paper (Leviton, 1983). This account and that of Gaulke (in press) appears to be the first vouchered records of this species from Panay.

Localities and specimens: (Site 1) PNM 1068; (Site 2) PNM 1069; (Site 25) PNM 1067, 1070.

Pseudorabdion mcnamarae Taylor

Prior to Sison et al. (1995) this species was known only from Negros and Luzon (Brown and Leviton, 1959; Alcala, 1986). Specimens from Mt. Baloy were collected at 950 m under rotting logs in original forest.

Locality and specimens: (Site 13) Two uncataloged specimens in PNM (PNM Field Numbers 163 and 209).

Pseudorabdion oxycephalum (Gunther)

Previously considered a rare snake endemic to Negros Island, this species is now known from other localities in the Luzon and Mindanao aggregate island complexes (Brown and Leviton, 1959; Leviton, 1963c; Alcala, 1986; Brown et al., 1999). This is the first published record from Panay. *Pseudorabdion oxycephalum* is been found in humus and under rotting logs from sea level to about 750 m.

Localities and specimens: (Site 6) CAS 137643; (Site 39) CAS 124174, 124193; (Site 41) CAS 124043.

Pseudorabdion talonuran Brown, Leviton and Sison

The discovery of this new species at high elevations was surprising. Both specimens were found under logs on Mt. Madja-as in forest classified as the transition zone between mixed dipterocarp (submontane) and mossy (upper montane; Whitmore, 1984). The holotype was found at 1500 m and the paratype at 1410 m.

Locality and specimens: (Site 11) CMNH 5076, PNM 2712.

Tropidonophis negrosensis (Taylor)

This species of water snake is common along forest streams from sea level to about 700 m (Leviton, 1963c; Alcala, 1986; Malnate and Underwood, 1988). The specimen from Mt. Madja-as was found on a river bank at midday.

Localities and specimens: . (Site 3) CAS 185749; (Site 6) CAS 137613; (Site 11) CMNH 5124; (Site 14) PNM 3911; (Site 22) CAS–SU 15971; (Site 28) CAS 124611; (Site 41) CAS 124047.

Zaocys luzonensis Gunther

A common tropical forest snake, this species ranges from sea level to over 1100 m (Leviton, 1983; Alcala, 1986; Ross et al., 1987). On Mt. Madja-as, we found two specimens active at midday in disturbed forest at low elevation.

Localities and specimens: (Site 1) PNM 1052; (Site 2) USNM 269078; (Site 7) PNM 1791; (Site 11) CMNH 5505; PNM 5663.

Elapidae

Calliophis calligaster gemianulis (Peters)

We collected one specimen on Mt. Madja-as at approximately 800 m on a mountain path away from water. They have previously have been found in a variety of semifossorial habitats associated with regenerated and climax forest (Leviton 1963b, 1963c; Alcala, 1986)

Localities and specimens: (Site 11) CMNH 5088, PNM 2719; (Site 13) PNM 1379; (Site 21) UPLB 2184; (Site 22) CM R2581; (Site 23) CAS-SU 12966–68; (Site 44) CAS 125364; (Site 47) CAS 125363.

Hydrophis belcheri Gray

This species has been recorded from the Visayan sea and is thought to be rare (Alcala, 1986).

Localities and specimens: (Site 5) USNM 38588; (Site 37) FMNH 202832–36, 202838, 202840–42.

Hydrophis cyanocinctus Daudin

Alcala (1986) mentioned records from the Visayan Sea.

Locality and specimens: (Site 37) FMNH 202843–54.

Hydrophis elegans Gray

Locality and specimen: (Site 5) USNM 38589.

Hydrophis inornatus Gray

Locality and specimen: (Site 23) CAS-SU 8778.

Lapemis hardwickii Gray

Alcala (1986) reported this species from the Visayan sea; he noted that specimens were collected by trawling.

Localities and specimens: (Site 23) USNM 77610–15.

Laticauda colubrina Schneider

This sea snake is found among rocks and in coral reef areas near shore; it is commercially used for its meat and hide (Alcala, 1986).

Locality and specimens: (Site 37) FMNH 202797–801, 202804–808, 202810.

Typhlopidae

Ramphotyphlops braminus (Daudin)

This species is common under rocks and other debris in agricultural areas. It can also be found in similar microhabitats along the edges of forested areas (Alcala, 1986). Taylor (1922d) reported catching many specimens under rocks immediately following rains.

Localities and specimens: . (Site 1) PNM 1044–46; (Site 8) CAS 127972, 128036; (Site 17) CAS 127746; (Site 18) CAS 127846, 127858, 127860; (Site 30) CAS–SU 12544–49; (Site 37) CAS 125041; (Site 46) CAS 124503.

Ramphotyphlops cumingii (Gray)

Alcala (1986) reports this blind snake is found in epiphytic ferns in the trees of moist forests at low to medium elevations. In all of his field work, Taylor (1922d) was unable to capture this species, suggesting he may have overlooked its preferred microhabitat.

Localities and specimens: (Site 28) CAS 169877; (Site 35) CAS 125092.

Typhlops castanotus Wynn and Leviton

Described very recently (Wynn and Leviton, 1993), this distinctive bicolored species is known from Negros, Panay (Makato), Boracay, and Inampulugan islands. It has been collected under debris in bamboo and coconut groves, hardwood forests and forest remnants.

Localities and specimens: (Site 3) CAS 139171; (Site 8) CAS 127973; (Site 42) CAS–SU 27934–46.

Typhlops hypogius Savage, *Typhlops luzonensis* Taylor, and *Typhlops ruber* Boettger

Found in detritus under rotting logs, these snakes have been collected in forests and disturbed areas near forest from sea level to about 800 m (Alcala, 1986). Wynn and Leviton (1993) followed McDowell (1974) in referring Philippine *T. luzonensis* and *T. hypogius* to *T. ruber*. Recently, McDiarmid et al. (1999) asserted that *T. luzonensis* and *T. hypogius* should be recognized until more compelling evidence is presented that would suggest they are conspecific with *T. ruber*. We agree, noting that the type localities for *T. hypogius* (Cebu), *T. ruber* (Samar), and *T. luzonensis* (Luzon) are each located on separate Pleistocene aggregate island complexes that might be expected to support independent lineages of blind snakes. If this is so, and the Visayan islands contain a single distinct lineage in this species complex, the name *Typhlops hypogius* would most likely apply to specimens from Cebu, Negros, Panay, Masbate, and smaller, land-bridge islands.

Localities and specimens: (Site 18) CAS 127861.

Family Viperidae

Tropidolaemus cf *wagleri* (H. Boie *in* F. Boie) (Figs. 51, 52)

This arboreal viper is common in forest bushes and small trees as well as mangroves (Taylor, 1922d; Leviton, 1964b; Alcala, 1986). The Mt. Madja-as specimen was found in a banana plantation at 800 m near primary forest. We find it unlikely that all SE Asian populations currently referred to *T. wagleri* will prove to be a single species. This is the first account of a specimen referable to this species from Panay.

Localities and specimens: (Site 11) CMNH 5076.

Discussion

The primary goal of this report has been to provide a comprehensive and synthetic review of the amphibian and reptiles species known from Panay Island and is surrounding land-bridge islets. As noted, over the past century, biologists have expected that the documented presence of a species on the neighboring island of Negros implied its undocumented presence on Panay as well (see Inger, 1954; Brown and Alcala, 1970, 1978, 1980, 1986; Brown and Rabor, 1967; Alcala, 1986). However, Panay (and its smaller satellite islets) supports low levels of endemicity, primarily as exemplified by populations at higher montane elevations. Panay has several species of amphibians and reptiles that have not yet been reported on Negros or Cebu, is known to support species that so far have not been documented on Panay. The presence on Panay of numerous new and undescribed species suggests that calculations of Panay's herpetological endemicity will continue to rise with continued survey work. Additionally, basic taxonomic studies of species complexes with representatives on Panay will no doubt further contribute to the total number of Panay endemics.

There are only a few reports of amphibians and reptiles of high elevation forests of Panay (Sison et al., 1995; W. Brown et al., 1997a; Ferner et al., 1997; R. Brown et al. 1999, this issue). Essentially, on each occasion that herpetologists have surveyed higher elevation forests of Panay, they have discovered new species. Other surveys conducted in forested regions of Panay include survey efforts of A. Diesmos, R. Crombie, and M.Gaulke (in press). Further high elevation surveys in well forested regions of Panay are greatly needed to gain an understanding and appreciation of these presumably relictal faunal elements.

There are numerous records that are included in this report that were not at all unexpected. These include widespread SE Asian and Philippine species that biologists have expected or assumed were present on Panay. Others have even been listed as known from Panay, but without specific reference to reliable locality data or museum specimens (see Alcala, 1986). These include the frogs *Bufo marinus, Kaloula picta, Occidozyga laevis, Platymantis corrugatus, Platymantis dorsalis, Rana vittigera*, the skink *Mabuya multifasciata*, and the snakes *Ramphotyphlops braminus, Acrochordus granulatus, Psammodynastes pulverulentus, Gonyosoma oxycephala*, and *Tropidolaemus* cf *wagleri*.

Another group of species includes forms known from other well-surveyed islands in the Visayas

Fig. 3. Habitat at 1510 m elevation on the western slope of Mt. Madja-as (Site 11; Photo: RMB).

Fig. 4. Primary forest at approximately 1400 m on the western slope of Mt. Madja-as (Site 11; Photo: RMB).

Fig. 5. Stunted cloud forest at the peak of Mt. Madja-as (1800 m); habitat of *Platymantis panayensis* (Site 11; Photo: RMB).

Fig. 6. Entirely deforested lower slopes (750 m and below) on the western face of Mt. Madja-as (Site 11; Photo: L. Ruedas).

Fig. 7. Deforested foothills of Mt. Baloy at Barangay Valderrama (Site 13; Photo: J. McGuire).

Fig. 8. Barangay San Carlos at 400 m on Mt. Baloy (Site 13; Photo: J. McGuire).

Fig. 9. The Cadian River near Valderrama at the base of Mt. Baloy (Site 13; Photo: J. McGuire).

Fig. 10. Gigante South Island, from a distance, in the Visayan sea (Photo: RMB).

Fig. 11. Flooded mangrove forest on northeast coast of Negros Island (Photo: RMB).

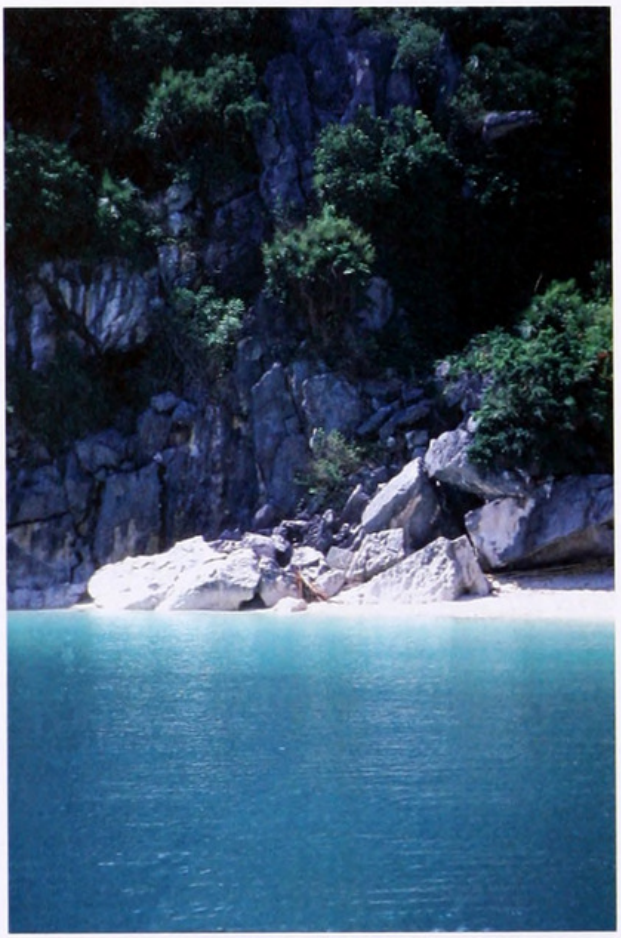

Fig. 12. South coast of Gigante North Island (Site 35; Photo: RMB).

Fig. 13. Limstone cave on Gigante South Island; habitat of *Gekko gigante* (Site 37; Photo: RMB).

Fig. 14. Jagged karst limestone habitat of *Platymantis insulatus* on Gigante South Island (Site 36; Photo: RMB).

Fig. 15. *Bufo marinus* (Photo: RMB).

Fig. 16. *Kaloula conjuncta negrosensis* (Photo: RMB).

Fig. 17. *Kaloula picta* (Photo: RMB).

Fig. 18. *Limnonectes* cf *leytensis* (Photo: RMB).

Fig. 19. *Limnonectes visayanus* (Photo: RMB).

Fig. 20. *Occidozyga laevis* (Photo: RMB).

Fig. 21. *Platymantis corrugatus* (Photo: RMB).

Fig. 22. *Platymantis insulatus* (Photo: RMB).

Fig. 23. *Rana erythraea* (Photo: RMB).

Fig. 24. *Rana vittigera* (Photo: RMB).

Fig. 25. *Polypedates leucomystax* (Photo: RMB).

Fig. 26. *Cuora amboinensis* (Photo: RMB).

Fig. 27. *Draco spilopterus* (Photo: J. McGuire).

Fig. 28. Draco spilopterus with extended patagium (Photo: J. McGuire).

Fig. 29. Mature female *Hydrosaurus pustulatus* (Site 23; Photo C. Banks).

Fig. 30. Immature female *Hydrosaurus pustulatus* (Site 11; Photo; J. McGuire).

Fig. 31. Mature male *Gonocephalus* sp (Photo: RMB).

Fig. 32. *Cyrtodactylus annulatus* (Photo: RMB).

Fig. 33. *Cyrtodactylus philippinicus* (Photo: RMB).

Fig. 34. *Gehyra mutilata* (Photo: RMB).

Fig. 35. *Gekko gigante* (Site 37; Photo RMB).

Fig. 36. *Gekko gigante* eggs in cave crevice (Site 37; Photo: RMB).

Fig. 37. *Gekko mindorensis* (Photo: RMB).

Fig. 38. *Brachymeles boulengeritaylori* (Photo: RMB).

Fig. 39. *Brachymeles boulengeri taylori* (Photo: RMB).

Fig. 40. *Brachymeles tridactylus* (Photo: RMB).

Fig. 41. *Mabuya multicarinata borealis* (Photo: J. McGuire).

Fig. 42. *Sphenomorphus jagori grandis* (Photo: RMB).

Fig. 43. *Tropidophorus grayi* (Photo: RMB).

Fig. 44. *Varanus salvator nuchalis*, dorsal view (Photo: J. McGuire).

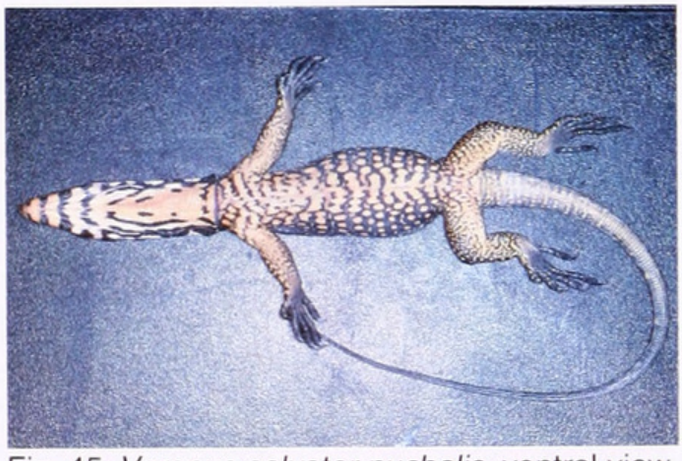

Fig. 45. *Varanus salvator nuchalis*, ventral view (Photo: J. McGuire).

Fig. 46. *Python reticulatus* (Photo: RMB).

Fig. 47. *Ahaetulla prasina preocularis* (Photo: RMB).

Fig. 48. *Dendrelaphis pictus pictus* (Photo: RMB).

Fig. 49. *Lycodon aulicus capucinus* (Photo: RMB).

Fig. 50. *Pseudorabdion mcnamarae* (Photo: RMB).

Fig. 51. Typical male *Tropidolaemus* cf *wagleri* (Photo: RMB).

Fig. 52. Typical female *Tropidolaemus* cf *wagleri* (Photo: RMB).

(Negros, Cebu) that we expected to find on Panay as well. Their presence on Panay was almost a certainty based on known biogeographic relationships of these islands. These species include the frogs *Kaloula c. negrosensis, Limnonectes* cf *leytensis,* the skinks *Lipinia pulchella taylori, Brachymeles boulengeri taylori, Mabuya multicarinata borealis, Tropidophorus grayi, Emoia atrocostata,* the geckos *Cyrtodactylus annulatus, Cyrtodactylus philippinicus,* the sail-fin agamid *Hydrosaurus pustulatus,* and the snakes *Boiga angulata, Boiga* cf *cynodon, Boiga* cf *dendophilia, Cyclocorus lineatus alcalai, Pseudorabdion mcnamarae, Oligodon modestum,* and *Trimereserus flavomaculatus* (Gaulke, in press).

Several other records are major range extensions and real surprises. The skink *Dasia semisincta* is otherwise known only from Borneo and Mindanao Island and its presence on Panay is based on a well vouchered specimen (USNM 78840) that can not be discounted. The presence of a new species in the genus *Hologerrhum* was surprising in that this genus previously was considered a monotypic Luzon Aggregate Island Complex endemic (Leviton, 1963c; Brown et al., this issue; Gaulke, in press). A forest species of *Kaloula* related to *K. kalingensis* and *K. kokacii* is the first record of this species group outside the boundaries of the Luzon Aggregate Island Complex (Inger, 1954; Brown and Alcala, 1970; Alcala and Brown, 1998; Brown and Diesmos, unpublished data; Gaulke, in press). Some records (based on few specimens or dubious locality data) may be in error; these include *Sphenomorphus coxi divergens, Sphenomorphus cumingi,* and *S. fasciatus* (of Sison et al., 1995); otherwise, if accurate, these records represent major range extensions beyond the confines of the Mindanao, Mindoro, and Luzon aggregate island platforms.

As mentioned, a number of new species recently have been described as Panay endemics; the presence of endemics in high elevation habitats of Panay was not unexpected. These species *Hologerrhum dermali* (Brown et al., this issue; see also Gaulke, in press), *Parvoscinus sisoni* (Ferner et al., 1997), *Platymantis panayensis* (Brown et al., 1997a), *Pseudorabdion talonuran* (Brown et al., 1999), *Kaloula* sp., *Platymantis* sp. 1, *Platymantis* sp. 2, and *Platymantis* sp. 3 (this report, see also Gaulke, in press).

Finally, there are numerous "subspecies", species, or members of widespread Visayan, Philippine, or SE Asian species complex members on Panay that are of uncertain taxonomic status and in need of basic taxonomic review (see individual species accounts). Many species currently listed from Panay are, we expect, distinct lineages that eventually will be recognized as Panay or Visayan endemics. These species are too numerous to list and extend from common, low elevation forms to rare high elevation forest obligates. There is much basic taxonomic work still to be conducted on Panay, in the Visayas, and in the rest of the Philippines and we expect our estimates of Panay's endemicity to generally rise with further systematic studies of the herpetofauna of the Philippines.

Faunal similarity calculations (Fig. 53) indicated that, as expected, the Visayan islands of Negros and Cebu (situated on the same Pleistocene aggregate island platform as Panay) were among the islands faunistically most similar to Panay (Masbate was not considered due to the absence of substantial records from this island). We interpret this as evidence for mid- to late-Pleistocene land bridge connections between these islands (see Heaney, 1985, 1986). Within the Visayan Aggregate Island Complex, estimates of amphibian faunal similarities exceeded those of reptiles but when Panay is compared to islands outside the Visayan Aggregate Island Complex, reptile faunal similarities exceed those of amphibians. As expected, amphibian faunal similarity between Luzon and Panay is much lower than estimates calculated for Cebu or Negros and Panay. However, surprisingly, Luzon and Panay had a higher reptile coefficient of similarity than did Cebu and Panay. A portion of this unusual finding may be the result of sampling error reflecting the degree to which survey data for Negros, Panay, and Luzon are available. Calculations of similarities between Negros and Luzon (not shown) are higher in reptiles (0.58) than they are for amphibians (0.45).

In comparisons with islands on other (non-Visayan) major Philippine aggregate island platforms, reptilian species similarity was consistently higher than that of amphibians. This may in part be due to antiquated taxonomy. Recently, disproportionate amounts of taxonomic work has been conducted on amphibian groups, resulting in the recognition of more amphibian endemics, with fewer "shared" species among islands. In contrast, many reptiles "species" are shared between Panay and Luzon. Some of these may represent species complexes in need of taxonomic resolution. Alternatively, these calculations may reflect the relatively greater dispersal abilities presumed for reptiles when crossing ocean barriers. It is tempting to consider that more reptile species may be shared between these islands because reptiles may be more tolerant of exposure to heat and salt water, and may have a higher probability of surviving dispersal events (e.g., via rafting) than would be expected for amphibians. In general, these results sup-

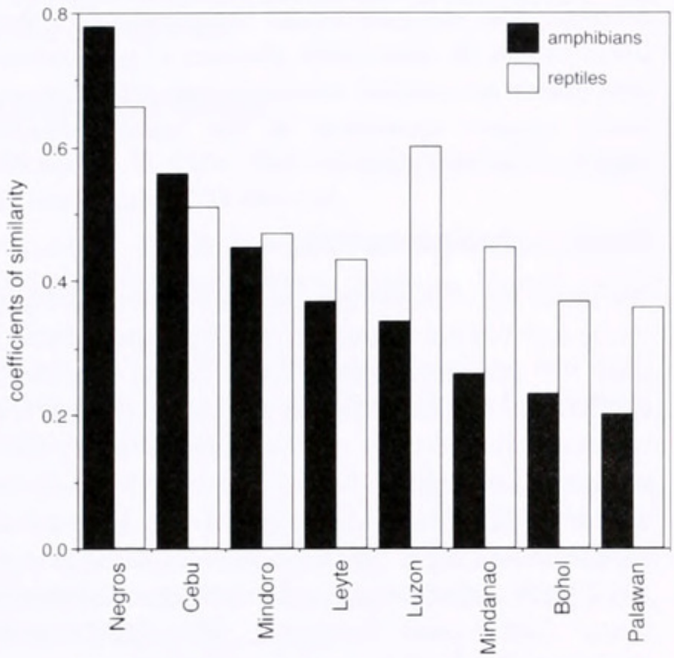

Figure 53. Faunal similarity coeffi cients, calculated bet ween Panay and other major islands in the Philippines. See text for formula and discussion.

port the suggestion that the herpetofaunal communities of islands within the Visayan Aggregate Island Complex are very similar but also that they have their own degree of endemism and are far from being identical.

Species that we might expect to soon be discovered on Panay include populations that are otherwise known from Negros and Cebu islands. However, we note that the high elevation endemics of Negros (e.g., *Platymantis hazelae, Pseudorabdion montanum*) are not expected to be discovered on Panay; in their place we expect Panay to support it's own high elevation populations of closely-related montane endemics (e.g., *Platymantis panayensis, Pseudorabdion talonuran*). These include the frogs *Rhacophorus pardalis* (Fig. 54), *Rhacophorus appendiculatus* (widespread on Mindanao and Luzon aggregate island complexes; both known from Negros), *Platymantis spelaeus* (known from Negros; Fig. 55), geckos such as *Lepidodactylus lugubris* (widespread in the Philippines), *Lepidodactylus herrei* (currently comprised of two subspecies: *L. h. herrei* on Negros and *L. h. medianus* on Cebu), *Lepidodactylus christiani* (known from Negros and Cebu), *Pseudogekko brevipes* (known from Negros and Cebu; *P. compressicorpus* has been collected on Masbate), a *Luperosaurus* species (*L. cumingi* has been collected on Negros), and skinks like *Lipinia quadrivittata quadrivittata* (from Negros and Cebu), *Lipinia auriculata auriculata* (from Negros and Masbate), and *Lipinia rabori* (from Negros). Snake species we expect will be found on

Fig. 54. *Rhacophorus pardalis*, present on Nergos but not yet recorded on Panay (Photo: RMB).

Fig. 55. *Platymantis spelaeus*, known from caves in southern Negros; this species has not yet been recorded on Panay (Photo: RMB).

Fig. 56. *Oxyrhabdion leporinum visayanum*, well-known and common throughout Nergos Island, but not yet recorded on Panay (Photo: RMB).

Panay with continued survey efforts include forms possibly related to *T. canlaonensis, T. hedraeus* (Negros forms), *Oxyrhabdion leporinum visayanum* (from Negros and Cebu; Fig. 56), and *Ophiophagus hannah* (recorded from numerous islands in the Philippines). The Philippine endemic crocodile, *Crocodylus mindorensis*, may have recently been rediscovered

on Negros (E. Alcala, personal communication) and may be present on Panay if suitable habitat can be located. As noted, the Gigante Island endemics *Platymantis insulatus* and *Gekko gigante* might be expected to occur on karst limestone outcrops on Panay's northeast coast.

The future of exploration on Panay guarantees continuation of the kind of discovery reported here. There is an immediate need for continued basic survey efforts in the montane portions of Antique, Aklan, and Iloilo provinces, all of which contribute to the western coastal mountain range that supports so much of Panay's herpetological endemicity. Additionally, low elevation portions of Panay (principally Capiz and Iloilo provinces) are also herpetologically unknown. If areas of overlooked primary forest or well-regenerated secondary forest can be located, we have high expectations that these will support novel herpetological communities and generate continued discoveries of new taxa. Areas of particular interest include karst limestone outcrops along the northern and eastern coasts, mangrove fragments, cave habitats, and isolated outcrops of moderate elevation in eastern Panay (Fig. 2). As noted, the best place to search for the Gigante endemics *Platymantis insulatus* and *Gekko gigante* is limestone outcrops supporting caves along Panay's northeastern coast. Other rare Negros species (i.e., *Luperosaurus cumingi, Lepidodactylus herrei, Platymantis spelaeus*) may eventually be revealed on Panay as well, once adequate surveys in preferred microhabitats (forest canopies and karst limestone caves; C. N. Dolino, personal communication) become available.

Like most islands in the Visayan Aggregate Island Complex, Panay should be regarded a priority for future conservation initiatives and programs aimed at sustainable resource management. Panay is a unique island (not at all identical to Negros) that deserves its own conservation efforts.

The few remaining forests of Panay continue to be felled at an alarming rate, suggesting that its endemic flora and fauna may disappear before even being recorded by biologists. Low elevation forests and mangroves are all but gone, and even the most disturbed and negatively impacted sites warrant immediate study of the kind that currently is underway on Cebu and Negros (A. Alcala, and E. Alcala, C. N. Dolino, J. C. Gonzales, and M. Pedregosa, personal communication). It is our hope that Panay will be recognized as a model island ecosystem, ripe for collaborative efforts of conservation biologists, taxonomists, biogeographers, community organizers, and politicians. Conservation efforts targeted at the community level represent the best opportunity for foreign, government, and non-government organizations in their effort to halt the destructive practices of non-sustainable timber and mineral extraction industries that currently operate unchecked in the central Visayan islands of the Philippines.

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