

# On a collection of reptiles from Southern Mindanao Island, the Philippines

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## Abstract

We describe a collection of reptiles composed of 97 specimens collected in a submontane area of southern Mindanao Island, Philippine Islands. In addition also specimens observed but not preserved, the collection includes 35 species, divided into 1 species of chelonian, 18 species of lizards and 16 of snakes. The recently described skink species *Eutropis indepressa* (BROWN & ALCALA, 1980) and *Tropidophorus davaoensis* BACON, 1980 are included in this collection. The range and extent of morphological variation are expanded for these species, as well as for the rare colubrid *Oligodon maculatus* (TAYLOR, 1918). We also provide the first precise locality on Mindanao of *Ophiophagus hannah*. All species but *Eutropis indepressa* had previously been recorded from Mindanao, but 33 species are new records for South Cotabato Province as currently defined. *Bronchocela cristatella* (KUHL, 1820), *Calamaria lumbricoidea* (H. BOIE in F. BOIE, 1827) and *Psammodynastes pulverulentus* (H. BOIE in F. BOIE, 1827) are the most common species, the total number of their respective specimens representing 29.9% of the whole collection. The composition of this collection is compared with the known fauna of Mindanao and other islands of the Philippine Islands. The reptile fauna around Lake Sebu is mostly similar to the faunas of other parts of Mindanao and of islands of the Central and Eastern Visayas.

**Keywords:** Chelonii, Squamata, Asia, Philippine Islands, Mindanao Island, biogeography, biodiversity.

## Introduction

The peculiar nature of the herpetological fauna of the Philippine Islands (referred to below as the Philippines) has been stressed by numerous authors, for example INGER (1954), TAYLOR (1922a, 1922b), LEVITON (1963b) and BROWN & ALCALA (1970). A high level of endemism is especially noteworthy in this country (BROWN & ALCALA, 1978, 1980). In this archipelago of over 7700 islands, Mindanao is the largest meridional island (HICKS, 2000). It is biogeographically connected to Borneo by the Sulu Archipelago. In spite of its great interests, both on zoological and zoogeographical grounds, Mindanao has received comparatively less attention from herpetologists than Luzon and central islands of the Visayas (Negros, Panay, and so on). Furthermore, most collecting efforts have been undertaken, from west to east, in the

Zamboanga Peninsula, around Mt. Malindang (Misamis Occidental Province), around Lake Lanao (Lanao del Sur Province), in Mt. Apo National Park (spreading over the boundaries of Davao del Sur and Cotabato Provinces), and in Davao Province. Although several early collectors obtained specimens from Mindanao (see BROWN & ALCALA, 1978, for a summary of herpetological collections from the Philippines), the first report on a herpetological collection from Mindanao was published by FISCHER (1885a, b), unfortunately without precise locality. Another early collector on Mindanao was Edgar A. MEARNs, who visited the island in 1906. Subsequently, E. H. TAYLOR collected in Mindanao (see below), the results of which appeared in his major monographs (TAYLOR, 1921, 1922a, b) and several papers. After World War II, other collections were gathered in Mindanao but did not result in specific publications on the herpetofauna of this island. More recently, SMITH (1993a, b) reported on a small collection from eastern Mindanao. Subsequently, although the herpetofauna of the Philippines has been the subject of revived interest (see for example, the various publications of M. GAULKE and R. BROWN), the uncertain, if not troubled political situation in Mindanao has precluded specific missions on this island.

In this paper, we describe a collection gathered between 1993 and 1998 by Pascal LAYS (PL hereafter) around Lake Sebu, South Cotabato Province, in the extreme south of Mindanao Island. Collections and observations took place at two distinct sites, referred to below as Site 1 on Mount Tasaday and its immediate surroundings, and Site 2, at Lake Sebu and its close vicinity respectively (see below for a description of the sites). These collections were made in the frame of anthropological studies on tribal people inhabiting montane forested areas. Although many specimens have been reported from "Cotabato Province" in the literature, this part of Mindanao had not previously been subject to any herpetological survey. TAYLOR (1922a) and LEVITON (1965a), for example, mentioned some specimens from Saub (6°2'53"N-124°29'14"E), a coastal city located just west of Maitum (now in Sarangani Province; see below) at the foot of the mountain range in which Lake Sebu is located. It seems that collecting efforts in this locality were rather incidental and limited to the coast. The political divisions of the Philippines are both complex and changeable. The former province of "Cotabato", as used

by TAYLOR and most subsequent authors cited below up to the mid 1960s, once encompassed nearly the whole of the southern half of the eastern part of Mindanao. This large province was first split in 1966, when South Cotabato was recognized as a separate province. In 1973, the remaining part of the province was divided into North Cotabato, Maguindanao, and Sultan Kudarat. Some maps still retain this political division (ANONYMOUS, n.d.). In 1983, North Cotabato was renamed Cotabato Province. Lastly, the southern coastal area of former South Cotabato was also separated as Sarangani Province in 1992. As a consequence, the few specimens reported from Saub by TAYLOR (for example 1922d: 101) now originate from Sarangani Province. Lastly, South Cotabato Province used to be included in Region XI of the regional division of the Philippines, Southern Mindanao. On September 19<sup>th</sup> 2001, the provinces of Sarangani and South Cotabato were moved from Southern Mindanao Region to Central Mindanao Region. The same year, this latter province was renamed SOCCSKARGEN (an acronym for South Cotabato, Cotabato, Sultan Kudarat, Sarangani and General Santos City).

Situated in southwestern Mindanao, the region that interests us here, and where collections and observations were made, stretches between two provinces: South Cotabato (Municipalities of Lake Sebu and Tboli) and Sarangani (West) (Municipalities of Kiamba, Maasim and Maitum). The area has the general shape of a slightly curved strip aligned along a north-west / south-east axis, extending over approximately 70 km from 124°30' to 124°55' East, width varying from 5 to 10 km between 6°20' and 5°55' North. The southern portion faces the Celebes Sea, the northern portion faces the Allah Valley, the western portion touches the Kulaman Valley and the eastern portion faces Sarangani Bay. The mountainous regions of Southwestern Mindanao, sometimes referred as the Cotabato Cordillera or the Southwest Coast Range, are the ancestral domains of some ethnic groups, whose economy rests on shifting cultivation (currently a threat for the remaining old growth forests): the Tiruray (also known as Tedulay) in the North (Maguindanao Province), the Cotabato Manobo in the central portion (Sultan Kudarat Province), the Tboli (and its Ubo subgroup), and the Tasaday in South Cotabato Province. The small populations of these tribal peoples did not seriously affect primary forest cover. Things changed with the arrival of settlers, from overpopulated places of Luzon and the Visayas, in the 1940s and the following decades. Large areas were then deforested, making room for permanent fields of corn, rice paddies, pineapple, grasslands for cattle, etc. These demographic and economic pressures exercised by settlers forced many indigenous communities to move deeper into the mountainous interior. Industrial logging, with all its negative impacts on the native flora and fauna, increased in the 1950s, cumulated in the 1970s, while in the 1980s a decrease was observed. Nowadays, parts of the estimated 100,000 ha of remaining old growth forests are diversely protected, although shifting cultivation, mining and pockets of illegal logging activities remain a threat to the wildlife (WERNSTEDT & SPENCER, 1967; COLLINS *et al.*, 1991; ANONYMOUS, 1993; LAYS, 2000, 2001, 2005, submitted).

*Altitude and Topography.* Elevations range from 600 m to ca.

2,000 m asl, the highest point being Mount Busa (124°41'E-6°07' N.) at 2,083 m asl. Flat lands are scarce and the topography is dominated by slopes of 18-30 % and 30-50 %; therefore, the region is rather rugged and even steep in many places.

*Hydrography.* It is in this mountainous forested area that all brooks, streams and rivers find their origin. Basically, the hydrological system can be divided in two parts: one that includes rivers like Keloung, Metutum, Pangay, Kling, that flow southward and reach the Celebes Sea; and a second one, including rivers like Sfakà, Lawa, Allah, Bunga, etc. that flow northward and reach the Allah Valley. Five natural lakes occur in these mountains: Lake Sebu (354 ha), Lake Lahit (24 ha), Lake Slótón (75 ha), Lake Nungon (a few ha) and Lake Maughan (or L. Hólón) which rests in the crater of a dormant volcano, Mount Parker (or Mt. Mélé Botu, ca. 300 ha, 1,800 m asl).

Undifferentiated mountain soil covers most of the area, with clay loams and semi-fine limons. Sandstone abounds, and Maitum and Maasim limestones occur in some portions of the considered area. Very large deposits of gold have been tapped for some 15 years, giving rise to local ecological disasters.

*Climate.* Although this part of Mindanao is classified amongst the regions without very pronounced seasonal characteristics, one can, however, observe a "dry season" from November to April (with February and March as the driest months) and a "wet season" from May to October. Mean annual rain fall averages from 2,000-2,500 mm, but above 2,500 mm in some areas. Temperature for Site 1 (in the vicinity of Mount Tasaday, at 1,015 m) in May 1993: 19-20° C at 5.30 AM, 25-26° C at noon, 24° C at 6.30 PM (sunset), 23.9° C at 8.45 PM; during the drier months, the temperature can drop to ca. 10° C., with a minimum at 4 AM. At Site 2, in the surroundings of Lake Sebu (alt. 700 m) the temperatures are 3 to 4° higher than those at Site 1.

Although only some 20 km separate Site 1 from Site 2, a very rugged mountain range occurs between them, so it usually takes two days of very hard hiking to reach Site 1 from Site 2. Furthermore, on an ecological basis, Site 1 differs greatly from Site 2:

SITE 1 (Fig. 1): Mount Tasaday (1,340 m asl) is located at the centre of the Manobo Tasaday Special Forest Reserve, a



Fig. 1. Site 1 (Photo P. Lays)

19,247 ha protected territory that was created in 1972 by Presidential Proclamation Nr 995, after the discovery of a cave-dwelling people named Tasaday (NANCE, 1983). The Reserve is included in Barangay Ned of Lake Sebu Municipality (the Philippines are divided into Regions, Provinces, Municipalities, Barangays and Sitios). Large parts of the Reserve remain covered with an old primary montane rain forest where Dipterocarpaceae dominate the other tree families. Mossy forests also occur. The forest can be divided into three storeys: the highest, with species of *Shorea*, *Vatica*, *Lithocarpus*. Below this dominant canopy, a second storey is predominantly occupied by *Dillenia*, *Lithocarpus*, *Palaquium*, *Goniothalamus*. A third layer is composed of small trees, palms, and tree ferns: *Anglaia*, *Clethra*, *Aralia*, *Glochidion*, *Ficus*, *Areca*, *Pinanga*, *Cyathea*, *Pandanus*, *Musa*. Amongst the climbers: *Dinorchloa*, *Calamus*, *Daemonorops*, *Freycinetia*, *Dioscorea*. Amongst its outstanding species is the largest of Philippine flowers (and one of the biggest in the world), *Rafflesia schadenbergiana* GÖPPERT. Amongst the emblematic animals living in those forests, one can mention the Philippine monkey-eating eagle (*Pithecophaga jefferyi* Ogilvie-Grant), the Philippine Tarsier (*Tarsius syrichta* (L.)), and the Philippine flying lemur (*Cynocephalus volans* (L.)). This primary forest is the home of many threatened species included in the redlists of Appendix I & II of CITES and IUCN, and many endemic and unique species that require absolute protection. Amongst the 28 species of Mammals recorded in Southwestern Mindanao, 1 is in Appendix I of CITES; 8 are in Appendix II of CITES; 6 are vulnerable or declining or with restricted range; 12 are endemic to the Philippines, including two endemic to Mindanao. As for the avifauna, 114 species of birds have been recorded so far, 45 taxa are diversely threatened, including 4 species in Appendix I of CITES; 17 species in Appendix II of CITES; 75 taxa are endemic to the Philippines, including 21 endemic to Greater Mindanao and 27 endemic to Mindanao. As in many other tropical countries, these figures deal only with the most studied, or easily observable animals, the vertebrates, and more specially the mammals and birds. However, it is obvious that many species belonging to other groups of vertebrates and invertebrates, as well as plants and fungi must also be threatened. Even if detailed data are not available, one can reasonably infer that from the fact that they all live in a vanishing ecosystem. Based on these facts, PL has asked the Philippine authorities for creating a new National Park in order to protect the remaining old growth forests of Southwestern Mindanao.

At Site 1, specimens were collected directly on Mount Tasaday or its immediate surroundings (old primary forest only), usually a few hundred meters away from it; some specimens were also collected in the secondary vegetation of a small hamlet named Libuta or Tefitok, standing along the Lemuyun River, where a part of the Tasaday people lived. The clearing of the primary forest in Libuta/Tefitok took place in the mid-1980s and, except for the western portion, which consists of a degraded primary forest, a secondary forest and secondary vegetation, the rest of the hamlet is surrounded by primary forest.

SITE 2 (Fig. 2): Lake Sebu, a tectonic lake of 354 ha, and its plateau lie 700 m above sea level in a hilly landscape, with



Fig. 2. Site 2 (Photo P. Lays)

mountain ranges closing the southern portion of their horizon. It is the centre of the administrative authorities of Lake Sebu Municipality and the heart of the ancestral land of the Tboli, an ethnic group that traditionally makes a living through shifting cultivation. This was so up to 1945-1950 when Christian settlers moved up from the lowlands of Allah Valley and Koronadal Valley, or even directly migrated from the overpopulated parts of Luzon and the Visayas, usually following and settling along the roads opened by the logging companies. The arrival of these new migrants dramatically changed the situation for Lake Sebu, both from an ecological and a socio-economic point of view. The once heavily forested area, with scattered secondary forests and patches of native rice and corn fields, gave way to an open landscape. Even the lakes (Sebu, Slótón, Lahit, Nungon) were not spared and were modified by the introduction of ducks and the *Tilapia* fishery. Nowadays, Lake Sebu and its immediate surroundings do not possess any more primary forests; the landscape is made of rice paddies (in the tableland of the Lówó Creek), and fields of corn, cassava, Manila hemp, etc.; here and there patches of secondary forest subsist; in a word, the wildlife of the area survives in a series of habitats mainly made of fields and secondary vegetation. At Site 2, the specimens were collected in the vicinity of Lake Sebu, within a radius of ca. 4 km from its centre.

The fieldtrips undertaken by PL were by no means zoological, so collecting resulted from casual encounters. The specimens were collected by PL or brought by the natives to PL; trapping was not used. Some other specimens were collected or observed at different localities around Lake Sebu, as specified below. Besides this collection from Mindanao, a few specimens were obtained on Luzon (see under *Gehyra*). In this paper, we give an account of this collection obtained in a place previously herpetologically unknown. A brief and preliminary comparison between the fauna of this southern range of Mindanao and other Philippine Islands is also provided.

### Material and methods

The following list results from the examination of preserved specimens for most species. For some common, unquestion-

able species, we also considered sight records; specimens were furthermore photographed. All specimens were collected by P. LAYS on Mindanao Island, from two close but ecologically distinct localities (see below), as follows:

SITE 1: South Cotabato Province, Municipality of Lake Sebu, Barangay Ned, Manobo Tasaday Special Forest Reserve, around Mt. Tasaday, 6°18'10"N-124°32'52"E, alt. 1000-1100 m, area of primary forest.

SITE 2: South Cotabato Province, Municipality of Lake Sebu, in the vicinity of Lake Sebu (Poblacion and adjacent Barangays), 6°13'N-124°42'E, alt. 700 m, area of secondary vegetation.

New records for South Cotabato Province are preceded by an asterisk (\*). South Cotabato Province should be understood according to the definition given above, i.e., excluding records from the current provinces of Sarangani, Cotabato and Sultan Kudarat. New records for Mindanao Island are identified by two asterisks (\*\*).

Species are listed in taxonomic order of families and alphabetical order of genera and species in each family. Each account includes: (1) collection numbers of examined specimens, (2) their sex, (3) snout-vent length and tail length, (4) date of collection, (5) the locality of collection, (6) comments, (7) distribution in the Philippines, (8) distribution outside the Philippines, and (9) biological information on the specimens collected or observed by P. LAYS.

In the section on the distribution in the Philippines, we indicate firstly the distribution in the archipelago, given at the island level. However, we cannot assume that the list of islands is exhaustive. We then summarize the known range on Mindanao, down to the province level, grossly from West to East and from North to South. Lastly, we give the distribution of the taxon outside the Philippines at the country level. When a taxon includes several subspecies, the range is given for the species as a whole.

Measurements were taken with a slide-caliper to the nearest 0.5 mm for lizards, with a ruler to the nearest millimeter for snakes. Ventral scales of snakes were counted according to DOWLING (1951). The terminal scute is excluded from the number of subcaudals. The number of dorsal scale rows at midbody is counted at the level of the ventral plate corresponding to half of the total ventral number. Values for symmetric head characters are given in left/right order.

ABBREVIATIONS. MEASUREMENTS AND MORPHOMETRY: SVL: Snout-vent length; TaL: Tail length; TaL/TL: ratio tail length/total length; TL: total length.

SCALATION CHARACTERS: DSR: number of dorsal scale rows; IL: infralabials; MSR: number of dorsal scale rows at midbody; PosOc: postoculars; PreOc: preoculars; SC: subcaudals; SL: supralabials; SupOc: supraoculars; Ven: ventrals; Tem: temporals.

MUSEUM ABBREVIATIONS: CAS-SU: The Stanford University collection, California Academy of Sciences, San Francisco, USA. – FMNH : The Field Museum of Natural History, Chicago, USA. – IRSNB: Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium.

## Results

### Chelonii

#### Bataguridae GRAY, 1869

#### *Cuora amboinensis amboinensis* (DAUDIN, 1802)\* (Fig. 3)



Fig. 3. *Cuora amboinensis amboinensis* (DAUDIN, 1802)  
(Photo P. Lays)

#### MATERIAL EXAMINED

3 specimens observed but not collected: one on 21-22th October 1990 in Datal Fuhow (Barangay Lem Fugun, Lake Sebu Municipality); one in the immediate vicinity of Lake Sebu (Site 1, sitio Tuko Galong) (Shell: length: 13.5 cm, width: 11 cm, height 4.5 cm) on 1 November 1997 (Fig. 3) and another one in sitio De Kolon (Lake Sebu, Poblacion) in February 1998.

#### COMMENTS

*Cuora amboinensis* (Daudin, 1802) was divided into four subspecies by Rummmler & Fritz (1991) and McCord & Philippen (1998): *C. a. amboinensis*, *C. a. couro* (Schweigger, 1812), *C. a. lineata* McCord & Philippen, 1998, and *C. a. kamaroma* Rummmler & Fritz, 1991. According to Gaulke & Fritz (1998), the Philippines are inhabited by the subspecies *C. a. amboinensis* (most islands) and *C. a. kamaroma*, restricted to the Sulu Archipelago.

#### DISTRIBUTION IN THE PHILIPPINES

Luzon, Polillo, Catanduanes, Marinduque, Mindoro, Calamian Archipelago, Masbate, Samar, Panay, Negros, Cebu, Bohol, Siquijor, Leyte, Dinagat, Mindanao, Basilan; Sulu Archipelago; Palawan (Brown & Alcalá, 1986; Iverson, 1992; Gaulke & Fritz, 1998; Brown et al., 2000).

*Mindanao*: known from the provinces of Zamboanga del Sur, Misamis Oriental, Lanao del Sur, Davao, Davao del Sur, Sul-



tan Kudarat, and South Cotabato (new record) (Iverson, 1992; Ferner et al., 2001; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

India (Assam; Nicobar Islands); Bangladesh; Myanmar; Thailand; Cambodia; Vietnam; Federation of Malaysia (West Malaysia, Sarawak, Sabah); Singapore; Indonesia (Sumatra, Simeulue, Enggano, Nias, Borneo, Java, Sumbawa, Sulawesi, Ambon, Halmahera, Ceram).

#### BIOLOGY

The Datal Fuhow and Tuko Galong specimens were kept for several years as pets by Tboli families, who fed them on rice, cassava or sweet potatoes. The De Kolon specimen was also kept for years by a Tboli family and has a very concave plastron (male). All specimens were tied with a rope fixed in a hole perforated into one of the postero-lateral scales. A Tboli informant stated that the species was edible (without specifically indicating that the animal was actually eaten), whereas another Tboli proclaimed that the species was considered to be poisonous and, consequently, was not eaten by the natives. No specimens were observed in the wild. It is very likely that the numerous human-induced ecological changes that have affected Lake Sebu (as well as neighbouring lakes) since the 1950s (logging, duck and Tilapia raising, and so on [Lays, 2000]) have negatively influenced the local population of this turtle.

According to Tboli and Tasaday informants, this species does not occur in the rugged and heavily forested areas that extend beyond Lake Sebu (Southeast, South and Southwest), where no lakes exist. It is not known if this species occurs or not in the volcanic Lake Maughan (or L. Hólón, elev. ca. 1,300 m) of Mount Parker (or Mt. Mélé Botu, elev. 1,842 m) in Tboli Municipality, but it is likely that it might exist, or have existed, in the "Seven Lakes" region (124°25'E-6°18'N; alt. 700-800 m) in the hills of Barangay Ned in Lake Sebu Municipality. It is also likely that the species still occurs in the three other lakes near Lake Sebu, namely Lake Lahit, Lake Slótón and Lake Nungon. According to the natives the species is now and has been very rare, even during the past decades.

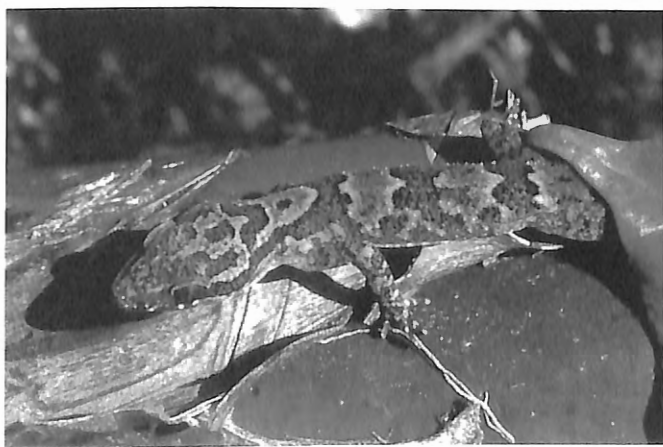


Fig. 4. *Cyrtodactylus annulatus* (TAYLOR, 1915) (Photo P. Lays)

#### Squamata

#### Gekkonidae GRAY, 1825

#### *Cyrtodactylus annulatus* (TAYLOR, 1915) \* (Fig. 4)

#### MATERIAL EXAMINED (3 specimens)

IRSNB 17248 (juvenile male; SVL 29.0 mm, TaL 3.0+28.5 mm [broken]; 24-II-1994), IRSNB 17264 (female; SVL 70.5 mm, TaL 6+48.5 mm [broken]; 27-IV-1994), IRSNB 17272 (male; SVL 61.0 mm, TaL 68.0 mm; 20-IV-1994), Site 1, 1000-1100 m.

#### COMMENTS

These specimens are typical of the species as defined by Taylor (1922b) and Brown & Alcala (1978). Our only adult male (IRSNB 17272) has 8 femoral pores, no pores nor enlarged scales on thighs, and 19/20 lamellae under 4<sup>th</sup> toe.

#### DISTRIBUTION IN THE PHILIPPINES

This species is known from Panay, Sicogon, Danjugan, Negros, Cebu, Pacijan, Ponson, Poro, Mactan, Bohol, Leyte, Camiguin, Mindanao, and Basilan; Sulu Archipelago (Jolo, Sibutu), and Palawan (Brown & Alcala, 1978, 1986; Alcala, 1986; Gaulke, 1996, 2003; Ferner et al., 2001).

*Mindanao*: known from the provinces of Zamboanga del Sur, Zamboanga del Norte, Misamis Occidental, Misamis Oriental, Agusan del Norte, Davao, Davao del Sur, and South Cotabato (new record) (Brown & Alcala, 1978; this work).

DISTRIBUTION OUTSIDE THE PHILIPPINES. This species is endemic to the Philippines.

#### BIOLOGY

Specimens IRSNB 17248 and IRSNB 17264 were collected in primary forest. The third animal was obtained in secondary vegetation. IRSNB 17264 was removed from beneath a rock in a sandstone rock shelter. When suddenly frightened, this species is capable of thanatosis, immobilising its breath and relaxing all the muscles of its body.

#### *Gehyra mutilata* (WIEGMANN, 1834) \*

#### MATERIAL EXAMINED (5 specimens)

IRSNB 17258 (male; SVL 42.0 mm, TaL > 15 mm; 15-X-1993), IRSNB 17270 (female; SVL 40.5 mm, TaL 43.3 mm; 28-XI-1993), Site 1, 1000-1100 m. – IRSNB 17267 (male; SVL 57.5 mm, TaL 42.0 mm), IRSNB 17268 (female; SVL 49.5 mm, tail broken), IRSNB 17269 (male; SVL 50.5 mm, TaL 56.0 mm), Site 2, 700 m.

#### COMMENTS

These specimens agree very well with the description given in Smith (1935).

## DISTRIBUTION IN THE PHILIPPINES

This species is known from throughout the archipelago: Luzon, Apo Reef, Maridunque, Mindoro, Tablas, Sibuyan, Samar, Leyte, Carabao, Boracay, Caluya, Panay, South Gigante, Calagnaan, Sicogon, Pan de Azucar, Guimaras, Inampulugan, Nadulao, Panobolon, Negros, Bantayan, Siquijor, Danjugan, Cebu, Pacijan, Poro, Ponson, Mactan, Bohol, Jao, Clara, Tilmudo, Bonoon, Lapinig Chico, Lapinig Grande, Balicasag, Camiguin, Mantique, Mindanao, Duitay; Sulu Archipelago: Jolo; and Palawan, Balabac (Brown & Alcala, 1978; Ferner et al., 2001; Gaulke, 2003).

*Mindanao*: provinces of Zamboanga del Sur, Davao del Sur and South Cotabato (new record) (Brown & Alcala, 1978; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

This widespread species is known from: *Asia*: Sri Lanka; India (including Andaman Is. and Nicobar Is.); Myanmar; Thailand; People's Republic of China (provinces of Yunnan, Guangdong, Hainan, and Hong Kong); Taiwan; Vietnam, Federation of Malaysia (West Malaysia and Borneo); Indonesia (Sumatra, Borneo, Java, Lesser Sunda Islands, Sulawesi, Timor, Moluccas, Irian Jaya). – *Australasia and Oceania*: Papua New Guinea (New Guinea, Admiralty Islands, Bismarck Archipelago, North Solomon Islands); Australia (Cook Islands, Christmas Islands, Cocos Islands); Solomon Islands; Micronesia (Palau, Caroline Islands, Mariana Islands, Guam, Marshall Islands, Wake Island); Melanesia (Fiji Islands); Tonga Islands; Western Samoa; Polynesia (Cook Islands; French Polynesia [Iles Australes, Gambier, Marquises, Iles de la Société, Tuamotou], American Samoa, Easter Island); Hawaii (introduced) (Bauer, 1994). – *America*: United States (California, Florida, introduced); Mexico (introduced). – *Southern Indian Ocean*: Madagascar, Nossi Bé, La Réunion, Mauritius, Seychelles.

## BIOLOGY

All these specimens were collected on human habitations, especially on roof tops, amidst secondary vegetation. Many more were observed, as this species is very common. All were active from 6.30 PM to 4.30 AM. Our specimens were recorded well above the altitudinal limit of 550 m indicated by Brown & Alcala (1978).

Four additional specimens were obtained by P. Lays on Luzon Island between 28 July and 8 August 1988: IRSNB 17251 (male; SVL 40.0 mm, TaL 34.2 mm), IRSNB 17252 (female; SVL 30.2 mm, TaL > 27.2 mm), IRSNB 17253 (female; SVL 43.1 mm, TaL > 31.7 mm), and IRSNB 17254 (female; SVL 36.8 mm, TaL 23.9 mm), all from Mayoyao, Ifugao Province. These specimens from Luzon were also limited to human habitations in an area of secondary vegetation.

## Agamidae SPIX, 1825

*Bronchocela cristatella* (KUHL, 1820) \*

## MATERIAL EXAMINED (8 specimens)

IRSNB 17177 (male; SVL 91.0 mm, TaL 293 mm; 1-IV-1998), IRSNB 17178 (male; SVL 69.5 mm, TaL > 120 mm; 1-IV-1998), IRSNB 17181 (female; SVL 86.5 mm, TaL 206 mm; 1-IV-1998), IRSNB 17249 (juvenile; SVL 31.5 mm, TaL 95.5 mm; 6-XII-1993), IRSNB 17257 (male; SVL 93.5 mm, TaL 290 mm; 27-XI-1993), IRSNB 17259 (male; SVL 82.5 mm, TaL 273.0 mm; 21-II-1994), Site 1, 1000-1100 m. – IRSNB 17190 (male; SVL 83 mm, TaL > 173 mm; 23-X-1997), IRSNB 17193 (male; SVL 95.0 mm, TaL > 155 mm; 14-XI-1997), Site 2, 700 m.

## COMMENTS

These specimens fall within the variation given by Diong & Lim (1998) and Hallermann (2006). All have the scales of the four or five upper dorsal scale rows pointing upwards.

## DISTRIBUTION IN THE PHILIPPINES

This species is known from Luzon, Mindoro, Carabao, Sibuyan, Panay, Negros, Cebu, Bohol, Leyte, Samar, Camiguin, and Mindanao; Sulu Archipelago; Calamian Islands and Palawan (Brown & Alcala, 1970; Diong & Lim, 1998; Hallermann, 2006).

*Mindanao*: provinces of Agusan del Norte, Bukidnon, Davao, Davao del Sur and South Cotabato (new record) (Taylor, 1922b; Smith, 1993a; Hallermann, 2006; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is widespread in Asia: India (Nicobar Islands); Myanmar; Thailand; Federation of Malaysia (West Malaysia [including Pulau Tioman] and Borneo); Singapore; Indonesia (Sumatra, Java, Natuna Islands, Borneo, Lesser Sunda Islands, Sulawesi, Moluccas, Halmahera, Misol, Irian Jaya); Papua New Guinea.

## BIOLOGY

All specimens were collected in primary forest, with the exception of IRSNB 17257, IRSNB 17190 and IRSNB 17193, which were obtained in secondary vegetation. These ecological preferences are similar to those mentioned by Diong & Lim (1998). It was observed that this species can change its colour very quickly, between 10-15 seconds to 1 or 2 minutes. When placed on a red support, the lizard body turns dark brown, lightly punctuated with green, whereas if the animal is placed on a white, yellow or green support, it turns green, finely and obliquely striated with brown. This is an obvious case of cryptic coloration, where the dark brown colour allows the lizard to merge with the bark of trees or forest floor; and the green colour makes it unspottable in the foliage.

*Draco bimaculatus* GÜNTHER, 1864 \*

MATERIAL EXAMINED (1 specimen)

IRSNB 17263 (male; SVL 71.5 mm, TaL 121.0 mm; 22-XI-1993), Site 1, 1000-1100 m.

## COMMENTS

This taxon was considered a subspecies of *Draco lineatus* Daudin, 1802 by Musters (1983). It was raised to specific status by Inger (1983) and McGuire & Alcalá (2000), whom we follow. This specimen agrees well with the diagnosis and description given by Musters (1983) and McGuire & Alcalá (2000). According to the data recorded by PL, the Tasaday people know also two other varieties or species of this genus, probably including *Draco mindanensis* (see below).

## DISTRIBUTION IN THE PHILIPPINES

This species is known from Samar, Leyte, Ponson, Dinagat, Siargao, Bohol, Mindanao, and Basilan; Sulu Archipelago (Jolo, Lapac, Lugus, Siasi, Bongao, Tawi-Tawi, Sanga Sanga, and Simonor) (Musters, 1983; McGuire & Alcalá, 2000).

*Mindanao*: provinces of Zamboanga del Norte, Zamboanga del Sur, Misamis Occidental, Agusan del Norte, Davao del Sur, and South Cotabato (new record) (Taylor, 1923, Musters, 1983; McGuire & Alcalá, 2000; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

## BIOLOGY

The sole specimen was obtained on the ground in primary forest, near a nest (belonging to a *Draco* as indicated by Tasaday informants) containing two white eggs (13 x 6 mm).

*Draco mindanensis* STEJNEGER, 1908 \*

MATERIAL EXAMINED (1 specimen)

IRSNB 17194 (female; SVL 81.0 mm, TaL 166.5 mm; 1-IV-1998), Site 1, 1000-1100 m.

## COMMENTS

This specimen agrees well with the description of Musters (1983) and McGuire & Alcalá (2000).

## DISTRIBUTION IN THE PHILIPPINES

This species is known from Samar, Leyte, Dinagat, and Mindanao (Musters, 1983; McGuire & Alcalá, 2000).

*Mindanao*: provinces of Zamboanga del Norte, Zamboanga del Sur, Misamis Occidental, Agusan del Norte, Cotabato, and South Cotabato (new record) (Musters, 1983; Smith, 1993a; McGuire & Alcalá, 2000; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

## BIOLOGY

This specimen was obtained in primary forest. According to McGuire & Alcalá (2000), this species seems to be dependent on primary forest or mature secondary vegetation.

*Gonocephalus semperi* (PETERS, 1887) \*  
(Fig. 5)

Fig. 5. *Gonocephalus semperi* (PETERS, 1887), male (Photo P. Lays)

MATERIAL EXAMINED (5 specimens)

IRSNB 17183 (female; SVL 106 mm, TaL 196 mm; 1-IV-1998), IRSNB 17184 (female; SVL 105.5 mm, TaL 186.5 mm; first half-year 1998), IRSNB 17188 (female; 101.5 mm, TaL 188 mm; 1-IV-1998), IRSNB 17196 (male; SVL 111.5 mm, TaL 189.0 mm; 1-IV-1998), IRSNB 17273 (female; SVL 108.0 mm, TaL 195 mm; 8-XII-1993), Site 1, 1000-1100 m.

## COMMENTS

These specimens agree well with the description of Taylor (1922b). In our series, two specimens have 9/9 SL, one has 10/9 SL, and one has 10/10 SL. Specimen IRSNB 17196, a male, has a SVL much longer than the value indicated by Taylor (1922b), which was 88 mm for a female.

## DISTRIBUTION IN THE PHILIPPINES

This species is known from Mindoro, Calamian Archipelago, Leyte, Bohol, Camiguin, and Mindanao (Taylor, 1922b; Alcalá, 1986).

*Mindanao*: provinces of Zamboanga del Sur, Zamboanga del Norte, Agusan del Norte, Davao, and South Cotabato (new record) (Taylor, 1922b; Smith, 1993a; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

## BIOLOGY

All specimens were collected in primary forest, with the exception of IRSNB 17273, which was collected on the edge of such a forest. This specimen was found on the ground. Tasaday informants claim that this lizard descends to the ground only where it lays its eggs on or in it.

## Scincidae Gray, 1825

*Brachymeles gracilis gracilis* (FISCHER, 1885) \*

## MATERIAL EXAMINED (1 specimen)

IRSNB 17247 (unsexed; SVL 47.0 mm, TaL 23.5+19.0 mm [broken]; 27-V-1993), Site 1, 1000-1100 m.

## COMMENTS

This specimen is pentadactyl and has the following main characters: 28 MSR, supranasals widely separated, postnasals present and large, anterior loreals in contact with SL 1-2, and faint dorsal stripes. According to Brown & Rabor (1967) and Brown & Alcala (1980), it is referable to the subspecies *Brachymeles gracilis gracilis*. On Mindanao, this subspecies has been recorded from Davao del Sur Province, a province adjacent to South Cotabato (Brown & Alcala, 1980). Another subspecies, *Brachymeles gracilis hilong* Brown & Rabor, 1967, is known only from the northeastern part of the island. In some characters, especially the number of MSR and of vertebral scales, this specimen is close to *Brachymeles schadenbergi* (Fischer, 1885), but its pattern is typical of *B. gracilis*.

In 1990, near Site 1, in the hamlet of Libuta/Tefitok, an apodal skink-looking lizard was surreptitiously observed beneath a dead stump standing in the middle of secondary vegetation. The lizard quickly sunk in the very fine dry soil, then disappeared in the vegetation. It seems likely that it might be an apodal *Brachymeles* species, although none has been recorded on Mindanao.

## DISTRIBUTION IN THE PHILIPPINES

*Brachymeles gracilis* (Fischer, 1885) is known from Bohol, Leyte, Camiguin, Mindanao, Basilan and the Sulu Archipelago. The subspecies *B. gracilis gracilis* has been recorded only from Mindanao and Basilan (Alcala, 1986).

*Mindanao*: the subspecies *B. g. gracilis* is known from the provinces of Bukidnon, Davao, Davao del Sur and South Cotabato (new record) (Brown & Rabor, 1967; Brown & Alcala, 1980, this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

## BIOLOGY

This specimen was obtained in secondary vegetation.

*Eutropis indeprensa* (BROWN & ALCALA, 1980) \*\*

## MATERIAL EXAMINED (1 specimen)

IRSNB 17255 (female; SVL 39.5 mm, TaL 7.5+68.0 mm [broken]), Lake Sebu.

## COMMENTS

This species was separated from *Mabuya multicarinata* mostly on the basis of the lower numbers of lamellae under 4<sup>th</sup> toe and the separation of the parietals. Our specimen agrees well with the original description of Brown & Alcala (1980: 122, 115: Fig. 13a; type locality: "In the area north-east of San Jose, Mindoro Island", Philippines). Its main characters are: 41 vertebral scales between parietals and the base of the tail, 30 MSR, 5 or 6 keels on dorsal scale rows, 16/17 lamellae under 4<sup>th</sup> toe, and interparietal large, entirely separating the parietals. The number of lamellae under 4<sup>th</sup> toe is slightly lower than the range (18-24) given by Brown & Alcala (1980).

## DISTRIBUTION IN THE PHILIPPINES

This species is known from Luzon, Mindoro, Panay, Negros, Cebu, Leyte, Bohol, Caluya, Samar, Camiguin, and Mindanao; Sulu Archipelago (Sibutu); Palawan (Brown & Alcala, 1980, 1986; Alcala, 1986; Gaulke, 1996, 2001b; Ferner et al., 2001).

*Mindanao* (new record): provinces of South Cotabato (new record) (this work). This species was cited from Mindanao by Brown & Alcala (1980) on the basis of three specimens, but their locality (Hacienda Waterous, Mangarin) is, in fact, on Mindoro Island. Probably on the basis of these mentions, Welch et al. (1990) also cited this species from Mindanao.

## DISTRIBUTION OUTSIDE THE PHILIPPINES

Federation of Malaysia: Borneo: State of Sabah (Das, 2004).

## BIOLOGY

No data.

*Eutropis multicarinata multicarinata* (GRAY, 1845) \*

## MATERIAL EXAMINED (2 specimens)

IRSNB 17175 (male; SVL 77.5 mm, TaL > 23 mm; first half-year 1998), IRSNB 17176 (female; SVL 69.6, TaL > 35 mm; 1-IV-1998), Site 1, 1000-1100 m.

## COMMENTS

These specimens agree well with the description that Brown



& Alcalá (1980) gave for *E. multicaerinata multicaerinata*. The other recognized subspecies, *Eutropis multicaerinata borealis* (Brown & Alcalá, 1980), occurs in the centre and north of the archipelago. Dorsal scales bear 8 or 9 keels; in both specimens 39 vertebral scales between the parietals and the base of the tail; parietals separated; the black vertebral stripe is distinct only on the nape and the anterior quarter of the body. These characters distinguish these specimens from *Eutropis englei* Taylor, 1925.

#### DISTRIBUTION IN THE PHILIPPINES

The species is known from Luzon, Polillo, Mindoro, Masbate, Samar, Panay, North Gigante, South Gigante, Caluya, Sigogon, Negros, Cebu, Bohol, Leyte, Dinagat, Mantiq, Camiguin, Mindanao, Basilan; Sulu Archipelago (Brown & Alcalá, 1980; Alcalá, 1986; Ferner et al., 2001). The nominative subspecies is present on Samar, Bohol, Leyte, Dinagat, Mantiq, Camiguin, Mindanao, Basilan, and the Sulu Archipelago.

*Mindanao*: provinces of Zamboanga del Norte, Zamboanga del Sur, Misamis Occidental, Agusan del Norte, Bukidnon, Davao, Davao del Sur, Cotabato, and South Cotabato (new record) (Taylor, 1925; Brown & Alcalá, 1980; Smith, 1993a; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

#### BIOLOGY

These specimens were collected in primary forest. Our specimens were collected well above the upper altitudinal limit of 733 m indicated by Alcalá (1986).

### *Eutropis multifasciata* (KUHL, 1820) \*

#### MATERIAL EXAMINED (3 specimens)

IRSNB 17186 (female; SVL 117.0, TaL > 52 mm; 1-IV-1998), IRSNB 17197 (female; SVL 119.5 mm, TaL > 214 mm [tip missing]; 1-IV-1998), IRSNB 17261 (male; SVL 122.0 mm, TaL 69+177 mm [broken]; 8-II-1994), Site 1, 1000-1100 m.

#### COMMENTS

These specimens agree well with the description of Taylor (1922b) and Brown & Alcalá (1980). Main diagnostic characters of specimen IRSNB 17186 are 33 MSR and prefrontals in broad contact. All specimens have 3 keels on their dorsal scales.

#### DISTRIBUTION IN THE PHILIPPINES

According to Brown & Alcalá (1980), this species is known from throughout the archipelago. It was definitely cited from Luzon, Mindoro, Sibuyan, Samar, Panay, Guimaras, Negros, Siquijor, Cebu, Bohol, Leyte, Mantiq, Camiguin,

Mindanao; Basilan, Sulu Archipelago (Jolo, Bubuan); Palawan (Brown & Alcalá, 1980; Ferner et al., 2001).

*Mindanao*: provinces of Zamboanga del Sur, Zamboanga del Norte, Misamis Occidental, Lanao del Norte, Bukidnon, Agusan del Norte and South Cotabato (new record) (Taylor, 1922b, 1925; Brown & Alcalá, 1980; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

*Asia*: India (states of West Bengal, Meghalaya, Assam, Arunachal Pradesh, Nagaland, Mizoram, Manipur, Tripura; Nicobar Islands); Myanmar; Thailand; People's Republic of China (provinces of Yunnan, Guangxi, Guangdong, Hainan); Taiwan; Laos; Cambodia; Vietnam; Federation of Malaysia (West Malaysia and Borneo); Indonesia (Sumatra, Borneo, Java, Lesser Sunda Islands, Sulawesi, Moluccas, Irian Jaya). – *Australasia*: Papua New Guinea.

#### BIOLOGY

All specimens were obtained in primary forest. Other specimens were also observed in open landscapes far from primary forest.

### *Lamprolepis smaragdina philippinica* (MERTENS, 1928) \*

#### MATERIAL EXAMINED (2 specimens)

IRSNB 17187 (female; SVL 121.5 mm, tail missing; 1-IV-1998), Site 1, 1000-1100 m. – IRSNB 17195 (male; SVL 104.0 mm, TaL > 40 mm; 09-V-1998), Site 2, 700 m.

#### COMMENTS

Three subspecies are currently accepted: *Lamprolepis smaragdina smaragdina* (Lesson, 1826), *Lamprolepis smaragdina philippinica* (Mertens, 1928) and *Lamprolepis smaragdina viridipuncta* (Lesson, 1830). Our specimens agree well with the diagnosis and description given by Brown & Alcalá (1980). In alcohol, the specimens turned to greenish-blue. Of the three recognized subspecies, only one occurs in the Philippines.

#### DISTRIBUTION IN THE PHILIPPINES

According to Brown & Alcalá (1980), this subspecies is known from throughout the archipelago, to which it is endemic. It has been definitely mentioned from Luzon, Mindoro, Masbate, Sibuyan, Samar, Panay, Inampulugan, Boracay, Jao, Bonoon, Negros, Siquijor, Cebu, Ponson, Pacijan, Bohol, Bonson, Leyte, Mantiq, Camiguin, Mindanao, Basilan; Sulu Archipelago (Tawi-Tawi, Sibutu); Palawan (including Busianga) (Brown & Alcalá, 1980; Alcalá, 1986; Gaulke, 1996; Brown et al., 2000; Ferner et al., 2001).

*Mindanao*: provinces of Zamboanga del Sur, Lanao del Sur, Davao, Davao del Sur, and South Cotabato (new record) (Taylor, 1922b, Brown & Alcalá, 1980; Smith, 1993a; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

The species occurs in: *Asia*: Indonesia (Lesser Sunda Islands, Sulawesi, Selayar, Savu, Roti, Wetar, Timor, Babar, Buru, Ambon, Seram, Kai, Tanimbar, Misool, Obi, Bacan, Ternate, Halmahera, Morotai, Saparua, Haruku, Nusa Laut, Banda, Damar, Waigeo, Salawati, Irian Jaya). – *Australasia and Oceania*: Papua New Guinea (including Bismarck Archipelago); Solomon Islands; Marshall Islands.

## BIOLOGY

Specimen IRSNB 17187 was collected in primary forest, whereas IRSNB 17195 was living in secondary vegetation. Smith (1993a) did not encounter this species in primary forest. In contrast to Brown & Alcalá's (1980) statement, the collection of these specimens up to about 1000 or 1100 m confirms its occurrence in submontane forests. Alcalá (1986) gave an upper altitudinal limit around 670 m asl.

*Lipinia auriculata herrei* (TAYLOR, 1922) \*

## MATERIAL EXAMINED (1 specimen)

IRSNB 17274 (unsexed; SVL 31.0 mm, TaL 32.0 mm; 20-V-18-VI-1994), Site 1, 1000-1100 m.

## COMMENTS

Brown & Alcalá (1980) recognized three subspecies: *Lipinia auriculata auriculata*, *L. auriculata herrei* (Taylor, 1922) and *Lipinia auriculata kempfi* (Taylor, 1919).

With a small but distinct tympanum, poorly developed hind limbs (59 % of axilla-groin distance and 30 % of SVL), and a rather uniform dorsum, our specimen is typical of the species *Lipinia auriculata* (Taylor, 1917). On the basis of 26 MSR, 4 large SupOc, prefrontals in narrow contact and frontoparietals distinct (not fused), we refer this specimen to the subspecies *L. auriculata herrei*.

## DISTRIBUTION IN THE PHILIPPINES

The species is known from Polillo, Tablas, Mindoro, Masbate, Cebu, Negros, Bohol, Mindanao. The subspecies *L. auriculata herrei* is present on Polillo, Bohol, and Mindanao (Brown & Alcalá, 1980, 1986; Alcalá, 1986). *Mindanao*: provinces of Agusan del Norte and South Cotabato (new record) (Brown & Alcalá, 1980; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

## BIOLOGY

This specimen was collected in primary forest.

*Lipinia subvittata* (GÜNTHER, 1873) \*

## MATERIAL EXAMINED (1 specimen)

IRSNB 17192 (male; SVL 43.5 mm, TaL > 15 mm; 1-IV-1998), Site 1, 1000-1100 m.

## COMMENTS

On the basis of the characters given in Brown & Alcalá (1980), this specimen is somewhat intermediate between *Lipinia subvittata* and *L. quadrivittata* (Peters, 1867). Its main diagnostic characters are as follows: (1) ear indistinct, forming a shallow depression, (2) eye moderate, (3) 20 MSR, (4) 53 vertebral scales between parietals and the base of the tail, (5) limbs not in contact when adpressed, (6) relative length of the toes: 4>3>5=2>1, (7) 19 lamellae under 4<sup>th</sup> toe, (8) prefrontals separated, large and distinct from frontonasals, (9) 2 loreals, (10) 6/6 SL, (11) 4 large supraoculars, (12) 3 rows of nuchals, and (13) dorsum copper brown, with faint black stripes only on the anterior part of the body. Characters (1), (2) and (13) are diagnostic of *Lipinia subvittata*, whereas character (3) is closer to *Lipinia quadrivittata* and (4) belongs to this latter species (48-53 vs. 57-62 in *L. subvittata* according to Brown & Alcalá [1980]). Nevertheless, its pattern is really distinct from that of *L. quadrivittata*. After comparison with four voucher specimens (CAS-SU 22199-22202; Masawan Sitio, Dapitan Peak, Mt. Malindang, Misamis Occidental Province, Mindanao Island; about 4400 ft), we refer our specimen to *L. subvittata*. The range of vertebral scale rows is hence extended to 53-62.

## DISTRIBUTION IN THE PHILIPPINES

In the archipelago, this species has been recorded only from Mindanao (Brown & Alcalá, 1980; Alcalá, 1986). *Mindanao*: provinces of Misamis Occidental and South Cotabato (new record) (Brown & Alcalá, 1980; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

Indonesia (Java, Sulawesi).

## BIOLOGY

This specimen was collected in primary forest. According to Alcalá (1986), this rare species is strictly restricted to aerial ferns of montane wet forests.

*Sphenomorphus fasciatus* (GRAY, 1845) \*  
(Fig. 6)

## MATERIAL EXAMINED (5 specimens)

IRSNB 17256 (male; SVL 84.5 mm, TaL 112.0 mm; 1-III-1994), IRSNB 17179 (male; SVL 86.5 mm, TaL > 37 mm; 1-IV-1998), IRSNB 17182 (male; SVL 68.0, TaL 99 mm; first half-year 1998), Site 1, 1000-1100 m. – IRSNB 17185 (male; SVL 58.0 mm, tail missing; 14-X-1997), IRSNB 17260



Fig. 6. *Sphenomorphus fasciatus* (GRAY, 1845) (Photo P. Lays)

(male; SVL 67.5 mm, TaL 93.0 mm; 25-VI-1995), Site 2, 700 m.

#### COMMENTS

These specimens agree well with the diagnosis and description given by Brown & Alcalá (1980). The SVL of specimens IRSNB 17256 and IRSNB 17179 are higher than the maximal values (80 mm) given by Brown & Alcalá (1980) and Alcalá (1986). Typically, the number of pale crossbands varies between 15 and 17. In life, specimen IRSNB 17256 had yellow dorsal crossbands (turning into ochre yellow in alcohol) and a yellowish-orange venter (cream in alcohol).

#### DISTRIBUTION IN THE PHILIPPINES

The species is known from Samar, Panay, Bohol, Leyte, Mantine, Camiguin, Mindanao, Basilan; Sulu Archipelago (Takela) (Brown & Alcalá, 1980; Alcalá, 1986).

*Mindanao*: provinces of Zamboanga del Sur, Misamis Occidental, Agusan del Norte, Bukidnon, Davao, Davao del Sur, Zamboanga del Sur, and South Cotabato (new record) (Taylor, 1923; Brown & Alcalá, 1980; Smith, 1993a; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

#### BIOLOGY

Among the four available specimens for which habitat data were recorded, two were obtained in primary forest, and two (IRSNB 17185 and IRSNB 17260) were encountered in secondary vegetation. More specimens were observed in this latter kind of vegetation.



Fig. 7. *Sphenomorphus mindanensis* TAYLOR, 1915 (Photo P. Lays)

#### *Sphenomorphus mindanensis* TAYLOR, 1915 \* (Fig. 7)

#### MATERIAL EXAMINED (1 specimen)

IRSNB 17189 (male; SVL 64.5 mm, TaL > 15 mm; 1-IV-1998), Site 1, 1000-1100 m.

#### COMMENTS

This specimen agrees well with the description given by Brown & Alcalá (1980). However, the number of lamellae under 4<sup>th</sup> toe is 23, vs. a maximal number of 20 according to Brown & Alcalá (1980). The SVL of this specimen is also well above the upper value (56 mm) given by Brown & Alcalá (1980) and Alcalá (1986). Other diagnostic characters are: 34 MSR, 63 vertebral scales, 4/5 SupOc, and prefrontals separated.

#### DISTRIBUTION IN THE PHILIPPINES

The species is known only from Bohol, Leyte, and Mindanao (Brown & Alcalá, 1980; Alcalá, 1986).

*Mindanao*: provinces of Agusan del Norte and South Cotabato (new record) (Brown & Alcalá, 1980; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

#### BIOLOGY

This sole specimen was collected in primary forest. According to Brown & Alcalá (1980), it is a montane species.

#### *Sphenomorphus variegatus* (PETERS, 1867) \*

#### MATERIAL EXAMINED (5 specimens)

IRSNB 17191 (male; 49.5 mm, TaL 86.0 mm; 1-IV-1998),

IRSNB 17250 (male; SVL 51.5 mm, TaL > 15 mm; 21-II-1994), IRSNB 17262 (female; SVL 46.0 mm, TaL 79.5 mm; 10-X-1993), IRSNB 17265 (female; SVL 46.5 mm, TaL 81.0 mm; 27-IV-1994), IRSNB 17266 (unsexed; SVL 26.0 mm, TaL 39.5 mm; 5-II-1993), Site 1, 1000-1100 m.

#### COMMENTS

These specimens agree well with the description given by Brown & Alcalá (1980). The numbers of MSR vary between 38 and 42. All specimens have 6 SL, a double row of black dorsal blotches, and a black dorsolateral nuchal blotch. In life, specimen IRSNB 17250 had the neck and throat orange and a yellow venter.

#### DISTRIBUTION IN THE PHILIPPINES

The species is known from Bohol, Leyte, Dinagat, Camiguin, Mindanao, Basilan, Bubuan; Sulu Archipelago (Jolo, Tawi-Tawi Islands) (Brown & Alcalá, 1980; Alcalá, 1986).

*Mindanao*: provinces of Zamboanga del Norte, Zamboanga del Sur, Misamis Occidental, Agusan del Norte, Davao, Davao del Sur, and South Cotabato (new record) (Taylor, 1922d, 1923; Brown & Alcalá, 1980; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

#### BIOLOGY

All specimens were collected in primary vegetation. Specimens IRSNB 17262 and 17265 were retrieved from under a rock in a sandstone rock shelter.

#### *Tropidophorus davaoensis* BACON, 1980 \* (Fig. 8)

#### MATERIAL EXAMINED (2 specimens)

IRSNB 17180 (female; SVL 132.0 mm, TaL > 114 mm [regenerated]); 1-IV-1998), IRSNB 17271 (unsexed; SVL 36.5 mm, TaL 48.5 mm; 28-IX-1993), Site 1, 1000-1100 m.



Fig. 8. *Tropidophorus davaoensis* BACON, 1980 (Photo P. Lays)

#### COMMENTS

This species was described by Bacon (*in* Brown & Alcalá, 1980: 229, 232; Fig. 20a-c; type locality: "in a quiet stream in the environs of the small hamlet of Malabutuan, Caburan Municipality, Davao Province, Mindanao Island, Philippines; near sea level", now in Davao del Sur Province). It had not previously been recorded from South Cotabato Province. Caburan is less than one mile north of Jose Abad Santos. Its occurrence on Mt. Tasaday extends its range by about 110 airline kilometers westwards.

Main morphological characters are as follows: vertebral scales (between parietals and base of the tail): 61-63; MSR: 37-36; divided prefrontals; 2 anterior loreals in both specimens; frontonasals divided; parietals separated.

With a SVL of 132 mm, specimen IRSNB 17180 exceeds the largest SVL value indicated by Bacon (1980) by 35 mm.

#### DISTRIBUTION IN THE PHILIPPINES

The species is endemic to Mindanao (Bacon, 1980).

*Mindanao*: provinces of Davao del Sur, Davao, and South Cotabato (new record) (Brown & Alcalá, 1980; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

#### BIOLOGY

These specimens were collected in primary forests. According to a Tasaday informant, this species lives along creeks, in holes dug by the lizard. Specimen IRSNB 17271 was discovered under a rock on humid moss, at the entrance of a sandstone rock shelter. Our specimens extend the former upper altitudinal limit cited by Bacon (1980), namely 750 m.

#### *Varanidae* GRAY, 1827

#### *Varanus salvator cumingi* MARTIN, 1839 \*

#### MATERIAL EXAMINED (1 specimen)

IRSNB 17198 (male; SVL 234 mm, TaL 347 mm; 22-V-1998), Site 2, Lowo Creek, 700 m.

#### COMMENTS

*Varanus salvator* (Laurenti, 1768) is currently divided into six or seven subspecies, of which three occur in the Philippines. Only the subspecies *Varanus salvator cumingi* Martin, 1839 has been recorded on Mindanao. Our specimen, a brightly colored juvenile specimen, agrees well with the diagnosis of this taxon (Gaulke, 1991).

#### DISTRIBUTION IN THE PHILIPPINES

Three subspecies (*Varanus salvator cumingi* Martin, 1839, *V. salvator marmoratus* (Wiegmann, 1834) and *V. salvator nuchalis* (Günther, 1872) are recognized from the archi-

pelago (Wicker et al., 1999). The species is known from Luzon, Mindoro, Calamian Archipelago, Masbate, Ticao, Samar, Panay, Sogon, Guimaras, Negros, Cebu, Bohol, Leyte, Mindanao, Basilan; Sulu Archipelago; Palawan (Taylor, 1922b; Alcala, 1986; Brown & Alcala, 1986; Gaulke, 1989, 1991, 1992, 1993; Ferner et al., 2001). *Varanus salvator cumingi* has been confirmed from Samar, Bohol, Leyte, Mindanao, and Basilan (Gaulke, 1991, 1993; Wicker et al., 1999).

*Mindanao*: provinces of Zamboanga del Sur, Misamis Occidental, Bukidnon, Agusan del Norte, and South Cotabato (new record) (Taylor, 1922b; this work).

#### DISTRIBUTION OF THE SPECIES OUTSIDE THE PHILIPPINES

*Asia*. Sri Lanka; India (Orissa, West Bengal, Assam, Meghalaya, Mizoram, Nagaland, Andaman Islands, Nicobar Islands); Bangladesh; Myanmar; People's Republic of China (provinces of Yunnan, Guangxi, Hainan, Guangdong and Hong Kong); Laos; Cambodia; Vietnam; Thailand; Federation of Malaysia (West Malaysia [including Pulau Tioman] and Sabah, Sarawak [Borneo]); Singapore; Indonesia (Sumatra, Nias, Bangka, Java, Bali, Borneo, Sulawesi, Lombok, Sumbawa, Flores, Alor, Wetar, and Timor). – *Australasia and Oceania*: Caroline Islands.

#### BIOLOGY

This young specimen was collected in secondary vegetation. The biology of this taxon has been detailed by Wicker et al. (1999). This species occurs in primary and secondary forests (as seen in the Tasaday Reserve) but also lives in the secondary vegetation in the vicinity of Lake Sebu.

#### Pythonidae FITZINGER, 1826

*Python reticulatus reticulatus* (Schneider, 1801)

#### MATERIAL EXAMINED

One specimen, not collected, Lake Sebu Municipality, Barangay Lem Fugun, Datu Mâ Falen Civil Reservation, down of sitio Takbu, along the Sfakà River (124°39'E-6°18'N), 28-I-1995.

#### COMMENTS

The taxonomy of this species has been recently modified by Auliya et al. (2002), who described two subspecies off Sulawesi. The populations of Philippines belong to the nominative subspecies, present throughout the remaining part of the range.

#### DISTRIBUTION IN THE PHILIPPINES

The species is known from Luzon, Polillo, Mindoro, Calamian Archipelago, Masbate, Samar, Panay, Negros, Cebu, Bohol, Leyte, Mindanao, and Basilan; Sulu Archipelago (Jolo, Tawi-Tawi, Sibutu); Palawan (Taylor, 1922a;

Alcala, 1986; Brown & Alcala, 1986; Gaulke, 1994a, 1996; Ferner et al., 2001).

*Mindanao*: provinces of Zamboanga del Sur, South Cotabato and Sarangani (Taylor, 1922a; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

India (Nicobar Islands); Bangladesh; Myanmar; Laos; Cambodia; Vietnam; Thailand; Federation of Malaysia (West Malaysia [including Pulau Tioman] and Sabah, Sarawak [Borneo]); Singapore; Brunei Darussalam; Indonesia (Pulau We, Babi, Sumatra, Simeulue, Nias, Mentawai Archipelago, Enggano, Riau Archipelago, Bangka, Belitung, Anamba Islands, Natuna Islands, Borneo, Krakatau, Java, Bali, Lombok, Sumbawa, Flores, Sumba, Sulawesi, Selayar, Tanahjampea, Butung, Sula Archipelago, Timor, Banda Besar, Tanimbar, Ternate, Buru, Ambon, Boano, Seram, Bacan, Halmahera).

#### BIOLOGY

The specimen cited above was found in secondary forest. This species occurs in secondary and, mainly, in primary forests of southwestern Mindanao. It was seen several times in primary forests, sleeping in hollow dead trunks during day time. From time to time, the natives capture this python for its meat and prefer females for their higher content of fat.

#### Colubridae OPPEL, 1811

*Ahaetulla prasina* (BOIE, 1827)

#### MATERIAL EXAMINED (1 specimen)

IRSNB 17202 (female; SVL 955 mm, TaL >565 mm; 1-IV-1998), Site 1, 1000-1100 m.

#### COMMENTS

The taxonomy of this species is uncertain. Depending on the authors, between zero and four subspecies are recognized as valid. According to Gaulke (1994b), three subspecies are recognized in the Philippines, namely *Ahaetulla prasina prasina* (Boie, 1827), *Ahaetulla prasina preocularis* (Taylor, 1922) and *Ahaetulla prasina soluensis* Gaulke, 1994. According to Leviton (1968), our specimen, with a divided anal, an undivided 4<sup>th</sup> SL, 1/1 PreOc, 9/9 SL and 3/2 loreals separated from the nasal by lower corner of the supranasals, would be fully referable to the nominative subspecies. However, Leviton (1968) and Gaulke (1994b) limited this subspecies to Palawan Archipelago. The taxonomy of *Ahaetulla prasina* is in urgent need of a thorough revision, and meanwhile we refrain from recognizing any subspecies. IRSNB 17202 is a very large specimen, entirely bright green with two white ventrolateral stripes.

#### DISTRIBUTION IN THE PHILIPPINES

The species is known from Luzon, Polillo, Batan, Calamian Archipelago (Busuanga, Coron, Culion), Masbate, Samar,



Panay, Negros, Cagayan, Cebu, Bohol, Leyte, Camiguin, Mindanao, Basilan; Sulu Archipelago (Jolo, Bongao, Sanga Sanga, Siasi, Sibutu, and Tawi-Tawi); Palawan (including Balabac) (Leviton, 1968; Alcalá, 1986; Brown & Alcalá, 1986; Gaulke, 1994b, 2001a; Ferner et al., 2001).

*Mindanao*: provinces of Zamboanga del Sur, Zamboanga del Norte, Lanao del Norte, Agusan del Norte, Bukidnon, Maguindanao, Agusan del Sur, Davao, Davao del Sur, and South Cotabato (Taylor, 1922a; Leviton, 1968; Smith, 1993b; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

India (West Bengal, Sikkim, Assam, Meghalaya, Arunachal Pradesh, Nagaland; Whitaker & Captain [2004]); Bangladesh; Bhutan; Myanmar; People's Republic of China (provinces of Xizang, Yunnan, Guizhou, Guangxi, Hainan, Guangdong, Hong Kong, and Fujian); Laos; Cambodia; Vietnam; Thailand; Federation of Malaysia (West Malaysia [including Pulau Tioman] and Sabah, Sarawak [Borneo]); Singapore; Brunei Darussalam; Indonesia (Sumatra, Simeulue, Nias, Mentawai Archipelago, Riau Archipelago, Bangka, Belitung, Anamba Islands, Natuna Islands, Borneo, Java, Bali, Lombok, Sumbawa, Flores, Sulawesi, Sangihe Archipelago, Ternate).

#### BIOLOGY

This specimen was obtained in primary forest above the upper elevational limit of 800 m cited by Leviton (1968) and Alcalá (1986). In this arboreal species, when a specimen reaches the tip of a branch, for instance, and finds itself in the impossibility to move forwards, it uses the tip of its tail as a probe to explore the out of sight environment, thus assisting the animal in moving backward. According to Tasaday informants, the body of females are dark green whereas males' are light green.

#### *Calamaria gervaisi*

DUMÉRIL, BIBRON & DUMÉRIL, 1854 \*

#### MATERIAL EXAMINED (1 specimen)

IRSNB 14939 (female; SVL 87.0 mm, TaL 6.0 mm; 30-XI-1993), Site 1, 1000-1100 m.

#### COMMENTS

This specimen agrees well with the diagnosis of Inger & Marx (1965). It has a very short tail, contained 0.07 time in SVL, 159 Ven, 16 SC, and no loreal.

#### DISTRIBUTION IN THE PHILIPPINES

The species is known from Luzon, Polillo, Tablas, Mindoro, Panay, Negros, Cebu, Mindanao, Basilan (Inger & Marx, 1965; Brown & Alcalá, 1986; Ferner et al., 2001).

*Mindanao*: provinces of Zamboanga del Norte, Maguindano, Misamis Oriental, Agusan del Norte, North Cotabato, Davao,

Davao del Sur, and South Cotabato (new record) (Inger & Marx, 1965; Smith, 1993b; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

#### BIOLOGY

This snake was collected in secondary vegetation.

#### *Calamaria lumbricoidea* (H. BOIE in F. BOIE, 1827) \*

#### MATERIAL EXAMINED (8 specimens)

IRSNB 14938 (male; SVL 362 mm, TaL 34 mm; 25-XII-1993), IRSNB 17208 (male; SVL 322 mm; TaL 34 mm; 22-II-1998), IRSNB 17214 (female; SVL 422 mm, TaL 25 mm; 1-XI-1997), IRSNB 17218 (male; SVL 392 mm, TaL 40 mm; 30-IV-1998), IRSNB 17219 (female; SVL 306 mm, TaL 24 mm), IRSNB 17224 (female; SVL 453 mm, TaL 27 mm; 3-V-1998), IRSNB 17225 (female; SVL 392 mm, TaL 25 mm; 5-I-1998), Site 2, 700 m – IRSNB 17216 (male; SVL 276 mm, TaL 25 mm; first half-year 1998), Lake Sebu.

#### COMMENTS

All these specimens agree well with the description given by Inger & Marx (1965). Main characters of our specimens appear in Table 1.

**Table 1.** Main morphological characters of *Calamaria lumbricoidea*

Number	IRSNB	Sex	TaL/TL	MSR	Ven	SC	SL	Gulars	Pattern
14938	M	0.086	13	179	22	5/5	3	Striped	
17208	M	0.096	13	174	23	5/5	3	Striped	
17216	M	0.083	13	184	21	5/5	3	Striped	
17218	M	0.091	13	179	23	5/5	3	Striped	
17214	F	0.056	13	194	17	5/5	3	Striped	
17219	F	0.073	13	203	15	5/5	3	Striped	
17224	F	0.056	13	197	16	5/5	3	Striped	
17225	F	0.060	13	196	16	5/5	3	Striped	

#### DISTRIBUTION IN THE PHILIPPINES

The species is known from Samar, Negros, Bohol, Leyte, Mindanao, Basilan (Brown & Alcalá, 1980; Alcalá, 1986).

*Mindanao*: provinces of Zamboanga del Sur, Zamboanga del Norte, Misamis Occidental, Misamis Oriental, Lanao del Norte, Lanao del Sur, Cotabato, Davao, South Cotabato (new record) and Sarangani (Inger & Marx, 1965; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

Thailand; Federation of Malaysia (West Malaysia; Sabah and Sarawak [Borneo]); Singapore; Indonesia (Nias, Sumatra, Mentawai Archipelago, Natunas Islands, Borneo, Java).

## BIOLOGY

All specimens for which habitat data were recorded were obtained in secondary vegetation. IRSNB 14938 was collected along a footpath.

*Coelognathus erythrura erythrura*  
(DUMÉRIL, BIBRON & DUMÉRIL, 1854) \*

## MATERIAL EXAMINED (1 specimen)

IRSNB 14952 (head only, but a female according to field notes; 29-XI-1993), Site 1, 1000-1100 m.

## COMMENTS

We follow Utiger et al. (2002, 2005), who placed this species into the genus *Coelognathus* Fitzinger, 1843. Five subspecies of *C. erythrura* were recognized by Leviton (1977) and Schulz (1996), four of which occur in the Philippines: *Coelognathus erythrura erythrura*, *Coelognathus erythrura manillensis* (Jan, 1863), *Coelognathus erythrura philippinus* (Griffin, 1909), and *Coelognathus erythrura psephenoura* (Leviton, 1977).

The binomen is often cited as *Coelognathus erythrurus*. However, the specific nomen is a composed noun in apposition, not an adjective. The correct spelling is thus *Coelognathus erythrura*.

Our sole specimen has the main following head scalation characters: SL 9/9 (4-6/4-6 entering orbit), PreOc 1/1, PosOc 2/2, Tem (1+1)/1 + 1/(1+1). According to the pattern of the head and the origin of this specimen, we refer it to the nominative subspecies.

## DISTRIBUTION IN THE PHILIPPINES

The species is known from Luzon, Polillo (?), Mindoro, Masbate, Samar, Panay, Guimaras, Negros, Cebu, Camotes Islands (Pacijan, Ponson, Poro), Bohol, Leyte, Camiguin, Mindanao, and Basilan; Sulu Archipelago (Bongao, Busanga, Siasi); Calamian Islands (Bongao, Busuanga, Culion); Palawan (including Balabac) (Leviton, 1977; Gaulke, 1994a; Gaulke & Altenbach, 1994; Schulz, 1996; Ferner et al., 2001). The nominative subspecies occurs on Samar, Camotes Islands (Pacijan, Poro), Bohol, Leyte, Camiguin, Mindanao, and Basilan; Sulu Archipelago (see above).

*Mindanao*: provinces of Zamboanga del Sur, Misamis Occidental, Agusan del Sur, Bukidnon, Maguindanao, Davao, and South Cotabato (new record) (Brown & Alcalá, 1980; Smith, 1993b; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

Indonesia (Sulawesi, Buton Island).

## BIOLOGY

This specimen was obtained in primary forest. The species also occurs in secondary forests and in secondary vegetation

but near primary or secondary forests. According to information provided by the Tasaday, the species preys on frogs. Leviton (1977) stated that all specimens of which he was aware were collected at or near sea level. Our specimen extends significantly the upper altitudinal limit of this species, given as 500 m above sea level by Alcalá (1986).

*Cyclocorus nuchalis nuchalis* TAYLOR, 1923 \*  
(Fig. 9)



Fig. 9. *Cyclocorus nuchalis nuchalis* TAYLOR, 1923  
(Photo P. Lays)

## MATERIAL EXAMINED (1 specimen)

IRSNB 14946 (male; SVL 304 mm, TaL 116 mm; 01-II-1994), Site 1, 1000-1100 m.

## COMMENTS

Two subspecies were recognized by Leviton (1967): *Cyclocorus nuchalis nuchalis* Taylor, 1923 and *Cyclocorus nuchalis taylori* Leviton, 1967. Our sole specimen has the main following scalation characters: 127 Ven, 57 SC, 17 MSR, 7/7 SL (3-4/3-4 entering orbit), 2/2 PreOc, 2/2 PosOc, 1+2/1+2 Tem, 9/9 IL; a few blotches on ventrals, white dots on the tip of ventrals rather dull, and a dark blotch on the nape. According to these characters, we refer this specimen to the nominative subspecies.

The similarity of morphology and pattern between this taxon and *Psammodynastes pulverulentus* is striking. The dentition is also rather similar, with, in *Cyclocorus nuchalis*: 5 + 3 strongly enlarged teeth + 10 + 2 strongly enlarged teeth.

## DISTRIBUTION IN THE PHILIPPINES

The species is known from Leyte, Camiguin, Mindanao, and Basilan (Leviton, 1967; Alcalá, 1986). The nominative subspecies occurs only on Mindanao (west and south) and Basilan.

*Mindanao*: provinces of Zamboanga del Sur, Zamboanga del Norte, Misamis Occidental, South Cotabato (new record), and Sarangani (Leviton, 1967; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

## BIOLOGY

This specimen was obtained in primary forest. According to the Tasaday people, this species moves by using the sidewinding method.

*Dendrelaphis caudolineatus terrificus* (PETERS, 1872) \*

## MATERIAL EXAMINED (2 specimens)

IRSNB 14953 (head + part of neck only; 18-XI-1993), Site 1, 1000-1100 m. – IRSNB 17210 (male; SVL 221 mm, TaL 96 mm; 1-IV-1998), Lake Sebu.

## COMMENTS

Leviton (1970a) recognized four subspecies within *Dendrelaphis caudolineatus* (Gray, 1834), to which Gaulke (1994a) added a fifth one. Four of them occur in the Philippines, namely, besides the nominative subspecies, *Dendrelaphis caudolineatus flavescens* Gaulke, 1994, *Dendrelaphis caudolineatus luzonensis* Leviton, 1961 and *Dendrelaphis caudolineatus terrificus* (Peters, 1872). *Dendrelaphis c. flavescens* and *D. c. luzonensis* are endemic to the archipelago, whereas *D. c. caudolineatus* is widespread in Southeast Asia and *D. c. terrificus* also occurs on Sulawesi.

Our specimens fully agree with the characters given by Leviton (1970a) to define the subspecies *D. caudolineatus terrificus*. Both have 13 MSR at the neck, a narrow, irregular ventrolateral stripe, and a lateral stripe on DSR 2-3 on the neck; in both, there is no other black stripe on the dorsum. IRSNB 17210 has 164 Ven, 96 SC, and a single anal plate.

## DISTRIBUTION IN THE PHILIPPINES

The species is known from Luzon, Polillo, Kalotkot, Mindoro, Calamian Archipelago (Busuanga, Coron, Culion), Masbate, Samar, Panay, Negros, Guimaras; Bantayan, Cebu, Bohol, Siquijor, Leyte, Camiguin, Mindanao, Basilan; Cagayan Sulu; Sulu Archipelago (Jolo, Bongao, Sanga Sanga, Tawi-Tawi); Palawan (including Balabac and Candaraman) (Leviton, 1970a; Brown & Alcalá, 1986; Gaulke, 1994a, 2001a; Gaulke & Altenbach, 1994; Ferner et al., 2001). According to the same authors, *Dendrelaphis caudolineatus terrificus* occurs on Polillo, Samar, Bantayan, Panay, Cebu, Siquijor, Leyte, Mindanao, and Basilan.

*Mindanao*: provinces of Zamboanga del Sur, Zamboanga del Norte, Misamis Occidental, Lanao del Norte, Lanao del Sur, Agusan del Norte, Bukidnon, Agusan del Sur, Cotabato, Davao, Davao del Sur, Maguindanao, Sultan Kudarat, South Cotabato (new record) (Leviton, 1970a; Smith, 1993b; this work). Probably present throughout the island.

## DISTRIBUTION OUTSIDE THE PHILIPPINES

Myanmar; Thailand; Federation of Malaysia (West Malaysia

[including Pulau Tioman], Sarawak and Sabah); Singapore; Brunei Darussalam; Indonesia (Babi, Mentawai Archipelago, Nias, Batu Islands, Sumatra, Bangka, Belitung, Riau Archipelago, Borneo, Java (?), Sulawesi; Bacan, Halmahera, Morotai, Ternate).

## BIOLOGY

Both specimens were collected in primary forest. In contrast to Leviton's (1970a) statement, this taxon is not restricted to low elevations and may reach at least 1000 m above sea level.

*Oligodon maculatus* (TAYLOR, 1918) \*

(Fig. 10)



Fig. 10. *Oligodon maculatus* (TAYLOR, 1918), adult specimen (Photo P. Lays)

## MATERIAL EXAMINED (3 specimens)

IRSNB 14935 (male; SVL 203 mm, TaL 45 mm; 8-II-1994), IRSNB 14936 (male; SVL 238 mm, TaL 57 mm; 9-XI-1993), IRSNB 14937 (female; SVL 181 mm, TaL 38 mm; 6-II-1994), Site 1, 1000-1100 m.

## COMMENTS

This is a rare species, previously known from only 5 specimens (Leviton, 1963a; Smith, 1993b). Our specimens are typical both in scalation and pattern with the description given in Leviton (1963a). All have a single anal and a pattern made of 16-18 strongly contrasted dark crossbands on the body and 3 on the tail. Other characters of this uncommon species are summarized in Table 2.

In our specimens, the number of SC in the female is lower than the values given by Leviton (1963a). As a consequence, considering also the data of Taylor (1918, 1925) and Smith (1993b), we redefine the morphological variation as follows: Maximal TL: 295 mm; ratio TaL/TL: 0.181-0.200 (males), 0.174-0.190 (females); Ven: 153-164 (males: 153-164; females: 162-163); SC 46-55 (males: 50-55; females: 46-54);

**Table 2.** Main morphological characters in *Oligodon maculatus*

Number	Sex	TaL/TL	MSR	Ven	SC	SL	Loreal	PreOc	PosOc	Temp
IRSNB 14935	M	0.181	17	154	50	7/7	0/0	2/1	2/2	1+2/1+2
IRSNB 14936	M	0.193	17	160	52	7/6	1/0	2/2	2/2	1+2/1+2
IRSNB 14937	F	0.174	17	163	46	7/7	0/0	2/2	2/2	1+2/1+2

DSR: 17-17-17 or 17-17-15 (1 specimen); Loreal: usually 0 (13/16 occurrences) or 1 (3/16 occurrences); PreOc: 1-2 (rarely 3). Other common characters: anal single, 2 PosOc and 1 (rarely 2) anterior temporal scales, 7 or 8 IL.

#### DISTRIBUTION IN THE PHILIPPINES

The species is endemic to Mindanao (Leviton, 1963a). *Mindanao*: provinces of Agusan del Sur, Surigao del Norte, Cotabato, Davao del Sur, and South Cotabato (new record) (Taylor, 1925; Leviton, 1963a; Smith, 1993b; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

#### BIOLOGY

All specimens were collected in primary forest. According to Tasaday informants, this species is mainly found in the proximity of *Varanus salvator*'s nests, hence its native name: "efuy felaes", which means "monitor's snake".

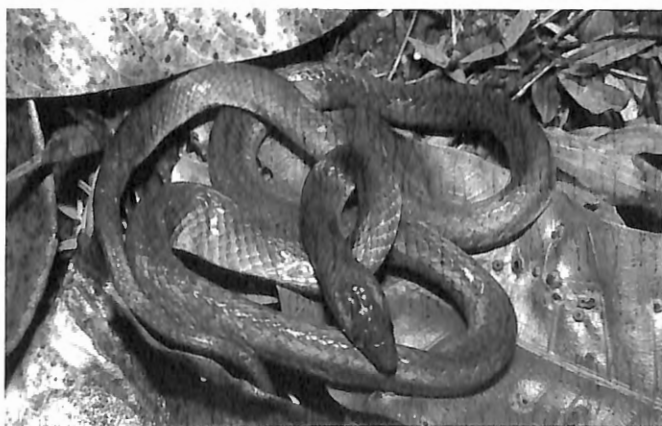
#### *Oxyrhabdium modestum*

(DUMÉRIL, BIBRON & DUMÉRIL, 1854) \*

(Fig. 11)

#### MATERIAL EXAMINED (1 SPECIMEN)

IRSNB 17201 (female; SVL 516 mm, TaL 109 mm; 22-V-1998), Site 2, 700 m.



**Fig. 11.** *Oxyrhabdium modestum* (DUMÉRIL, BIBRON & DUMÉRIL, 1854) (Photo P. Lays)

#### COMMENTS

This specimen agrees well with the description given in Taylor (1922a) and Leviton (1965a). Its main characters are: 15-15-15 DSR, 193 Ven (+ 1 preventral) (vs. 162-191 in Leviton [1965a]), > 51 SC, anal plate single, prefrontal in contact with orbit on each side, 1/1 loreal, not entering orbit but in contact with SL 3-5 on both sides (2-5 in Taylor [1922a] and Leviton [1965a]), SL 8/8, PreOc absent, 2/2 PosOc, 1+2/1+2 Tem, IL 7/7.

#### DISTRIBUTION IN THE PHILIPPINES

The species is known from Samar, Negros, Bohol, Leyte, Dinagat, Camiguin, Mindanao, and Basilan (Leviton, 1965a; Alcalá, 1986).

*Mindanao*: provinces of Zamboanga del Sur, Zamboanga del Norte, Misamis Occidental, Agusan del Norte, Agusan del Sur, Cotabato, Davao, Davao del Sur, South Cotabato (new record), and Sarangani (Taylor, 1922a, 1922d; Leviton, 1965a; Smith, 1993b; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

#### BIOLOGY

This specimen was collected in secondary vegetation.

#### *Psammodynastes pulverulentus pulverulentus*

(H. BOIE in F. BOIE, 1827) \*

#### MATERIAL EXAMINED (13 specimens)

IRSNB 14945 (female; SVL 442 mm, TaL 98 mm; 21-XI-1993), IRSNB 14947 (male; SVL 348 mm, TaL 91 mm; 9-XI-1993), IRSNB 14948 (female; SVL 218 mm, TaL 45 mm; 29-XII-1993), IRSNB 14950 (male; SVL 209 mm, TaL 57 mm; 2-II-1994), IRSNB 14951 (head only; 16-XII-1993), IRSNB 17205 (female, SVL 326 mm, TaL 68 mm; 1-IV-1998), IRSNB 17207 (juvenile; SVL 168 mm, TaL 42 mm; 1-IV-1998), IRSNB 17209 (juvenile; SVL 158 mm, TaL 34 mm; 1-IV-1998), IRSNB 17212 (male; SVL 346 mm, TaL 82 mm; 1-IV-1998), IRSNB 17213 (male; SVL 371 mm, TaL 96 mm; 1-IV-1998), IRSNB 17220 (female; SVL 501 mm, TaL 100 mm; 1-IV-1998), IRSNB 17226 (male; SVL 295 mm, TaL 100 mm; 1-IV-1998), Site 1, 1000-1100 m. – IRSNB 17217 (female; SVL 405 mm, TaL 90 mm; 1<sup>st</sup> half-year 1998), Lake Sebu.

## COMMENTS

Two subspecies are currently recognized. *Psammodynastes pulverulentus papenfussi* Zhao, 1995 was described to accommodate specimens from Taiwan. All other populations are referred to the nominative subspecies.

Our specimens agree well with the definitions given by Rasmussen (1975) and Leviton (1983). The pattern varies greatly in our specimens. Some (for example IRSNB 14948, IRSNB 17205) are very dark, with a strongly contrasting white pre- and supraocular streak, whereas other specimens (IRSNB 14950) are light and nearly patternless.

## DISTRIBUTION IN THE PHILIPPINES

The species is known from Luzon, Polillo, Batan, Calamian Archipelago (Busuanga), Samar, Panay, Negros, Cebu, Bohol, Leyte, Dinagat, Mindanao, Basilan; Sulu Archipelago (Jolo); Palawan (including Balabac) (Leviton, 1983; Brown & Alcala, 1986; Alcala, 1986; Ferner et al., 2001).

*Mindanao*: provinces of Zamboanga del Sur, Zamboanga del Norte, Misamis Occidental, Lanao del Sur, Agusan del Sur, Surigao del Norte, Davao, and South Cotabato (new record) (Taylor, 1922a, 1922d; Leviton, 1983; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

Nepal; India (West Bengal, Sikkim, Assam, Meghalaya, Arunachal Pradesh, Mizoram; Whitaker & Captain [2004]); Bangladesh; Bhutan; Myanmar; People's Republic of China (provinces of Xizang, Yunnan, Guizhou, Hunan, Jiangxi, Guangxi, Hainan, Guangdong, Hong Kong, and Fujian); Taiwan; Laos; Cambodia; Vietnam; Thailand; Federation of Malaysia (West Malaysia [including Pulau Tioman] and Sabah, Sarawak [Borneo]); Singapore; Brunei Darussalam; Indonesia (Sumatra, Nias, Mentawai Archipelago, Enggano, Riau Archipelago, Bangka, Belitung, Natuna Islands, Borneo, Java, Bali, Lombok, Sumbawa, Sumba, Komodo, Rinca, Flores, Sulawesi, Togian Archipelago, Sula Archipelago, Sangihe Archipelago).

## BIOLOGY

All specimens were collected in primary forest. Specimen IRSNB 14948 was collected on forest floor. According to Leviton (1983), this species is usually found in hilly areas, which may explain the proportionally high number of specimens in the present collection. In Sumatra, most Sumatran records were made at rather low elevations (David & Vogel, 1996).

*Rhabdophis auriculatus auriculatus* (GÜNTHER, 1858) \*  
(Fig. 12)

## MATERIAL EXAMINED (7 specimens)

IRSNB 14944 (female; SVL 283 mm, TaL 110 mm; 11-XII-1993), IRSNB 14942 (male; SVL 270 mm, TaL > 79 mm; 26-XI-1993), IRSNB 17222(1) (male; SVL 118 mm, TaL 43 mm; 1-IV-1998), IRSNB 17222(2) (male; SVL 105 mm, TaL



Fig. 12. *Rhabdophis auriculatus auriculatus* (GÜNTHER, 1858) (Photo P. Lays)

> 12 mm; 1-IV-1998), IRSNB 17222(3) (female; SVL 121 mm, TaL 42 mm; 1-IV-1998), IRSNB 17222(4) (female; SVL 108 mm, TaL 36 mm; 1-IV-1998), IRSNB 17223 (female; SVL 298 mm, TaL 112 mm; 1-IV-1998), Site 1, 1000-1100 m.

## COMMENTS

Leviton (1970b) recognized two subspecies, namely the nominative one and *Rhabdophis auriculatus myersi* Leviton, 1970, mostly on the basis of a different pattern in the postocular region of the head.

Our specimens are typical of the nominative subspecies (Leviton, 1970b), with 17 MSR in all animals and the typical white postocular blotch reaching the corner of the mouth, without dark lower postocular diagonal streak, as shown in Leviton (1970b: 355; Fig. 7). Other main characters of adult specimens are summarized in Table 3. All these specimens have 2 strongly enlarged posterior maxillary teeth.

## DISTRIBUTION IN THE PHILIPPINES

The species is known from Luzon, Samar, Bohol, Leyte, Mindanao, and Basilan. *R. auriculatus auriculatus* has the same range (Leviton, 1970b). *R. auriculatus myersi* is known from western and northern Mindanao (provinces of Zamboanga del Sur, Zamboanga del Norte, Misamis Occidental and Bukidnon).

*Mindanao*: provinces of Agusan del Sur, Davao, Davao Oriental, Cotabato, and South Cotabato (new record) (Leviton, 1970b; Smith, 1993b; this work).

## DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

## BIOLOGY

All specimens were obtained in primary forest. Specimen IRSNB 14942 was collected along a creek. Its stomach contains the remains of an unidentifiable frog. This species is common along the brooks in primary and secondary forests,



**Table 3.** Main morphological characters of *Rhabdophis auriculatus auriculatus*

Number	Sex	TaL/TL	MSR	Ven	SC	SL	PreOc	PosOc	Tem
IRSNB 14942	M	—	17	147	80	8/8	1/1	3/3	2+2/2+2
IRSNB 14944	F	0.280	17	151	84	8/8	2/2	2/2	1+2/1+2
IRSNB 17223	F	0.273	17	152	82	8/8	2/2	2/2	1+2/1+2

as well as in dense riparian secondary vegetation and that up to several hundreds meters away from primary or secondary forests.

*Rhabdophis lineatus* (PETERS, 1861) \*  
(Fig. 13)

MATERIAL EXAMINED (3 specimens)

IRSNB 14954 (head only; 9-XII-1993), IRSNB 17215 (male; SVL 333, TaL 102 mm; 1-IV-1998), Site 1, 1000-1100 m., IRSNB 17211 (female; SVL 147 mm, TaL 48 mm; 3-IV-1998), Site 2, 700 m.

COMMENTS

Head scalation of all specimens is typical of the species, with 8/8 SL, 2/2 PreOc, 3/3 PosOc and 1+2/1+2 Tem. A strongly contrasted white stripe extends in front of and behind the eye.

DISTRIBUTION IN THE PHILIPPINES

The species is known from Samar, Bohol, Mindanao, and Basilan (Alcala, 1986).

*Mindanao*: provinces of Zamboanga del Sur, Zamboanga del Norte, Misamis Occidental, Agusan del Sur, Davao del Sur, and South Cotabato (new record) (Taylor, 1922a, 1922d; this work).

DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.



**Fig. 13.** *Rhabdophis lineatus* (PETERS, 1861) (Photo P. Lays)

BIOLOGY

Specimens IRSNB 14954 and IRSNB 17215 were collected in primary forest, whereas IRSNB 17211 was obtained in secondary vegetation.

*Tropidonophis dendrophiops* (GÜNTHER, 1883) \*  
(Fig. 14)

MATERIAL EXAMINED (2 specimens)

IRSNB 17206 (male; SVL 245 mm, TaL > 75 mm; 1-IV-1998), IRSNB 17221 (male; SVL 615 mm, TaL 247 mm; 1-IV-1998), Site 1, 1000-1100 m.

COMMENTS

*Natrix dendrophiops negrosensis* Taylor, 1917 was elevated to full species status by Malnate & Underwood (1988). This species is thus monotypic.

By their very large eyes and their scalation, these specimens are typical of the species. Specimen IRSNB 17206 is in bad condition, but IRSNB 17221 has 19-17-17 MSR, 158 Ven (+ 2 preventrals), 92 SC, anal divided, 9/9 SL (4-6 entering orbit), 2/2 PreOc (the lower one being very small), 3/3 PosOc, 2+2/2+2 Tem.

DISTRIBUTION IN THE PHILIPPINES

The species is known from Camiguin, Bohol, Leyte, Mindanao and Basilan (Taylor, 1922a; Brown & Alcala, 1986; Alcala, 1986; Malnate & Underwood, 1988).



**Fig. 14.** *Tropidonophis dendrophiops* (GÜNTHER, 1883) (Photo P. Lays)

*Mindanao*: provinces of Zamboanga del Sur, Agusan del Sur, Davao, Davao del Sur and South Cotabato (new record) (Taylor, 1922a; Smith, 1993b; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

#### BIOLOGY

Both specimens were obtained in primary forest. Our specimens were collected above the upper altitudinal limits (700 meters above sea level) indicated by Alcalá (1986) and Smith (1993b).

### Elapidae BOIE, 1827

#### *Naja samarensis* PETERS, 1861 \*

#### MATERIAL EXAMINED (1 specimen)

IRSNB 17204 (male; SVL 301 mm, TaL 54 mm; 1-IV-1998), Site 1, 1000-1100 m.

#### COMMENTS

This taxon was elevated to full species status by Wüster & Thorpe (1991). Following Taylor (1922a) and Leviton (1965b), this young specimen is identifiable as *Naja samarensis* on the basis of the following characters: DSR 21-19-13, 174 Ven (+2 preventrals), 46 SC; above blackish-brown with a cream net; preventrals and Ven 1-4 yellow, Ven 5-24/25 black; nuchal mark looking as a black "8".

#### DISTRIBUTION IN THE PHILIPPINES

The species is known from Samar, Bohol, Leyte, Camiguin, and Mindanao (Taylor, 1922a; Leviton, 1965b; Alcalá, 1986).

*Mindanao*: provinces of Zamboanga del Sur, Zamboanga del Norte, Misamis Occidental, Lanao del Norte, Lanao del Sur, Bukidnon, Agusan del Sur, Davao, and South Cotabato (new record) (Taylor, 1922a, 1922c, 1922d; Leviton, 1965b; Smith, 1993b; this work).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

#### BIOLOGY

The sole available specimen was obtained in primary forest.

#### *Ophiophagus hannah* (CANTOR, 1836) \*

#### MATERIAL EXAMINED (1 specimen)

IRSNB 14956 (head only; 4-III-1994), Site 1, 1000-1100 m.

#### COMMENTS

The enlarged paraparietals are diagnostic of this species. The freshly killed specimen was 310 cm long (total length). This large head (length from the tip of the snout to the rear of the jaws: 64.8 mm) has the following scalation: 8/7 SL (3-4 entering orbit), 1/1 PreOc, 3/3 PosOc, Tem 2+2, 1 pair of paraparietals, IL 8/8. Length of one fang: 7.2 mm.

#### DISTRIBUTION IN THE PHILIPPINES

The species is known from Luzon, Mindoro, Calamian Archipelago (Busuanga), Panay, Negros, Dinagat, and Mindanao; Sulu Archipelago (Balabac, Jolo) (Taylor, 1922a; Leviton, 1965b; Alcalá, 1986; Brown & Alcalá, 1986; Gaulke et al., 2003).

*Mindanao*: The present record in South Cotabato Province is the first published definite locality on Mindanao. Leviton (1965b) just mentioned that the species was known from the "Southern part of the island, without exact locality data". The collections of the FMNH contain four specimens of *Ophiophagus* collected on Mindanao (I. Das, pers. comm., May 2006), from Mt. McKinley, Madaum and Tagum, Davao Province, and Malita Municipality, Province of Davao del Sur, but these localities had not been published previously.

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

Nepal; India (Karnataka, Goa, Kerala, Tamil Nadu, Uttar Pradesh, Bihar, Orissa, West Bengal, Sikkim, Assam, Meghalaya, Arunachal Pradesh, Nagaland, Mizoram, Tripura; Andaman Islands; Whitaker & Captain [2004]); Bangladesh; Bhutan; Myanmar; People's Republic of China (provinces of Xizang, Yunnan, Sichuan, Guizhou, Guangxi, Hainan, Guangdong, and Fujian); Laos; Cambodia; Vietnam; Thailand; Federation of Malaysia (West Malaysia [including Pulau Tioman] and Sabah, Sarawak [Borneo]); Singapore; Brunei Darussalam; Indonesia (Sumatra, Mentawai Archipelago, Riau Archipelago, Bangka, Borneo, Java, Bali, Sulawesi).

#### BIOLOGY

This specimen was obtained in secondary vegetation bordering a primary forest.

### Crotalidae OPPEL, 1811

#### *Pariás flavomaculatus* (GRAY, 1842) \* (Figs. 15-16)

MATERIAL EXAMINED (4 specimens). IRSNB 14940 (head only; 17-XI-1993), IRSNB 14941 (female; SVL 706 mm, TaL 109 mm; 11-III-1994), IRSNB 17199 (male; SVL 640 mm, TaL 134 mm; 1-IV-1998), IRSNB 17200 (male; SVL 697 mm, TaL 153 mm; 1-IV-1998), Site 1, 1000-1100 m.

COMMENTS. We follow Malhotra & Thorpe (2004) regarding the generic allocation of this species previously placed in the genus *Trimeresurus* Lacepède, 1804. Leviton (1964) recog-

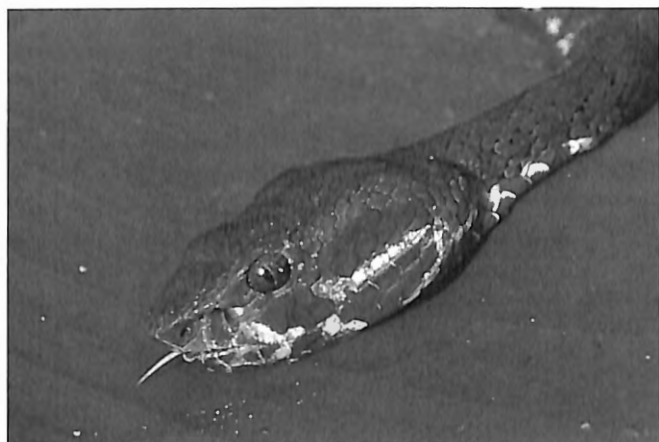


Fig. 15. *Parias flavomaculatus* (GRAY, 1842), head (Photo P. Lays)

nized three subspecies, *P. flavomaculatus flavomaculatus*, *P. flavomaculatus mcgregori* (Taylor, 1919) and *P. flavomaculatus halieus* (Griffin, 1910). *Parias mcgregori* was, without justification, considered a distinct species by Gumprecht (2001) and Gumprecht et al. (2004), but regarded as a subspecies by Sanders et al. (2004) and Vogel (2006). The intraspecific taxonomy of this species being still unresolved, we do not recognize any subspecies within *Parias flavomaculatus* at this time. Another point in case is that two morphs occur in sympatry. Specimens IRSNB 17199-200 and IRSNB 14940 (for the head and neck only in this latter animal) show the pattern typical of the species, namely dark brown crossbands on a dark green background (see Gumprecht et al., 2004 and Vogel, 2006). In contrast, specimen IRSNB 14941 (Fig. 16) is quite different. It differs by a reduced pattern made of a few faint vertebral or dorsolateral blotches, a stouter body, and a lower number of ventral plates. This specimen belongs to Vogel's (2006: 126) "*Trimeresurus* sp. B". Pending a revision of Philippine pitvipers of the genus *Parias*, we do not here separate this specimen from *Parias flavomaculatus*. The main scalation characters of our four animals are given in Table 4.

#### DISTRIBUTION IN THE PHILIPPINES

The species is known from Batanes Archipelago; Luzon, Polillo, Catanduanes, Mindoro, Panay, Negros, Bohol, Leyte, Dinagat, Camiguin, Mindanao, Sulu Archipelago (Jolo) (Leviton, 1964; Alcala, 1986; Ferner et al., 2001; Gaulke, 2001a).



Fig. 16. *Parias flavomaculatus*, IRSNB 14941, general view (Photo P. Lays)

*Mindanao*: provinces of Zamboanga del Norte, Misamis Occidental, Lanao del Sur, Agusan del Sur, Davao, Davao Oriental, and South Cotabato (new record) (Leviton, 1964; this work and David, unpublished data).

#### DISTRIBUTION OUTSIDE THE PHILIPPINES

This species is endemic to the Philippines.

#### BIOLOGY

All of our specimens were collected in primary forest. According to Tasaday informants, this species is nocturnal and feeds on small mammals. Tasaday people also reported that, during their night hunting or gathering trips, this pitviper would attack the torch (native or electric) held by the hunter, forcing the person to drop it for a while. Interestingly, Tasaday people name "*kibang busug*" the banded specimens typical of *Parias flavomaculatus*, whereas specimen IRSNB 14941 belongs to a form locally known as "*muhù*". According to these people, this latter never attacks torches.

#### Discussion

Our collection includes 97 specimens. With 13 specimens, *Psammodynastes pulverulentus* is the best represented taxon, followed by *Bronchocela cristatella* and *Calamaria lumbricoidea* (8 specimens each), and *Rhabdophis auriculatus* (7 specimens). The total number of the respec-

Table 4. Main morphological characters of specimens of *Parias flavomaculatus*

Number	Sex	TaL/TL	MSR	Ven	SC	SL	C3SL	Cep	Bands
IRSNB 17199	M	0.173	21	175	72	11/12	0/0	13	strong
IRSNB 17200	M	0.180	21	174	71	11/10	0/0	9	strong
IRSNB 14941	F	0.134	21	184	61	11/10	0/0	12	absent
IRSNB 14940	—	—	—	—	—	10/10	0/0	11	strong

tive specimens of these sole four species represents 37.1 % of the whole collection. All recorded species but *Eutropis indeprenta* had previously been recorded from Mindanao (see above for a discussion). In contrast, 33 of the 35 species are new records for South Cotabato Province, as it is currently defined. This is strong testimony for the poor knowledge of the reptile fauna of Mindanao, especially when one thinks that Lake Sebu is comparatively close to the coast.

Although no voucher specimen is available, the colubrid genus *Chrysopelea* probably occurs in this area. In November 1995, a Tasaday man called the attention to the existence of a big snake dwelling in the canopy of a huge tree, at the border of the primary forest, and locally known by the natives as *efuy lumayan*, which means "flying" or "gliding snake". It might refer to a *Chrysopelea* sp. It is well known that species of the genus *Ahaetulla* may also glide (and *A. prasina* occurs in the considered territory). However, the natives clearly distinguish between *efuy begkes daun* (*Ahaetulla prasina*) and *efuy lumayan* (probably *Chrysopelea* sp.).

The genus *Crocodylus* used to inhabit this region, although no specimens were captured, seen or photographed. Nevertheless, its past occurrence in the considered region can be claimed without doubt. Locally known, in Tboli language, as *bwaya*, the description provided by native informants perfectly fit with a species of crocodile (TL: 1,50 m). The species formerly occurred in lakes Sebu, Lahit, Slótón, Nungon, Hólón and in the main rivers like Lenon, Allah, etc. In Barangay Ned (Lake Sebu Municipality), in the so-called "Seven Lakes" region, one of these lakes is named, in Tboli, *benwaya*, which is indicative of the (past) occurrence of crocodiles there. Although feared by the natives, the species was not hunted. The arrivals of settlers, after WWII, that started a duck raising industry in most of those lakes might have contributed to the decline then to the eradication of crocodiles here, as settlers seeing a threat in this animal both for their own security and for their duck raising industry (the ducks feeding in the lakes). In 1954, a very strong typhoon affected Southwestern Mindanao (and certainly other areas) for four days, leaving numerous and very important landslides and damages. From then on, no crocodile has ever been seen in the region of Lake Sebu. Other sources confirmed that the crocodiles disappeared from that region between 1950 and 1955. In Tboli culture, people still make reference to crocodiles in their folktales or, for instance, in the shape of their traditional coffins (*lungun benwaya*) where a stylised head of a crocodile is sculptured.

The 35 species listed in this paper are far from covering the entire reptile fauna known from Mindanao Island. Many lowland species were not recorded, but, although this collection was obtained in a submontane area, many species known from montane forests of Mindanao are also missing. One must remember that these specimens are not the result of herpetological expeditions, and this might explain these lacunae. Let us note, too, that Tboli people can name 25 taxa of snakes that live in their immediate surroundings or in the forests and 20 taxa of lizards; whereas the Tasaday know 31 taxa of snakes and 27 of lizards. Those native figures probably better reflect the herpetological biodiversity of the considered area, even if native people may give different names to members of a same species depending on their coloration.

Establishing a list of reptiles of Mindanao is beyond the scope of the present paper. BROWN & ALCALA (1970) listed no less than 53 species of lizards and 39 snake species from this island. Nevertheless, most of these records were based on voucher specimens collected in western and central Mindanao. The extreme southern portion of the island has barely been explored as far as herpetology is concerned. For this reason, we think it is nevertheless useful to provide a preliminary comparison of the reptile fauna of South Mindanao with adjacent regions on the basis of the present collection and of references listed in Table 5. Taxa have been considered at the species level only.

For our faunal comparison, we arbitrarily divide Mindanao into four artificial regions (abbreviations used in Table 5 placed in brackets): *South* (MS): provinces of South Cotabato, Sarangani, Sultan Kudarat and Davao Del Sur. *Centre* (MC): Maguindanao, Cotabato, Davao del Norte, Compostella Valley, Davao Oriental, Lanao del Sur, Lanao del Norte, Bukidnon. *North* (MN): Misamis Oriental, Agusan del Sur, Agusan del Norte, Surigao del Norte (including Dinagat and Siargo Islands), and Surigao del Sur. *West* (MW): Misamis Occidental, Zamboanga del Norte, Zamboanga del Sur (including Basilan but not Jolo Islands). Other regions of the Philippines recognized here are: Sulu Archipelago (SU; including Jolo); Eastern Visayas (EV) (Masbate, Leyte, Samar and Biliran); Central Visayas (CV) (Negros, Cebu, Bohol, Siquijor and Camotes); Western Visayas (WV) (Panay, Sicogon and Guimaras); Palawan and Calamian (PA); Mindoro (MR); Luzon (LU; including Polillo). Lastly, other parts of Southeast Asia considered in our comparison are: Sulawesi (SW); Borneo (BO); and Asian mainland (AS). The sources have been given in species accounts.

According to our results, none of our 35 species is endemic to South Cotabato, but two are known only from Mindanao (*Tropidophorus davaoensis* and *Oligodon maculatus*). No less than 23 species (65.7 %) are endemic to the Philippines (13 species of lizards and 10 species of snakes). Between about 74 and 80 % of species recorded around Lake Sebu are known from other parts of Mindanao, including the remote Zamboanga Peninsula in the extreme western part of the island. An even higher percentage is shared with the Eastern (82.9 %) and Central (85.7 %) Visayas, whereas the shared value with the Western Visayas (54.3 %) is much lower than for other groups of the Visayas, and not much higher than the value (51.4 %) obtained for Luzon, the most distant major island from Mindanao. In contrast, the percentage of species shared with the Sulu Archipelago is only slightly higher, with 57.1 %, although this archipelago is geographically close to the southern coast of Mindanao. Palawan is more distantly related (40.0 %). Lastly, the percentages of similarity between Lake Sebu and Sulawesi, Borneo and the Asian Mainland vary between 31.4 and 34.3 %, although the shared species are not the same. These values include wide-ranging species, such as *Cuora amboinensis*, *Gehyra mutilata*, *Bronchocela cristatella*, *Eutropis multifasciata*, *Varanus salvator*, *Python reticulatus*, *Ahaetulla prasina*, *Psammodynastes pulverulentus*, and *Ophiophagus hannah*. The values may differ between lizards and snakes, but the trends in the percentages of shared species are similar. A no-

table exception is found with the East Visayas, for which the value of shared species is much lower in snakes than in lizards. Our values, or at least the trends, are close to those provided by BROWN & ALCALA (1970). These authors based their discussions on definite islands, whereas we considered rather groups of islands in the Visayas. The high similarities between the fauna of extreme South Mindanao and the Eastern and Central Visayas support the hypothesis of the "eastern route" suggested by BROWN & ALCALA (1970), and a different origin for the fauna of the Western Visayas and especially Palawan. It is also interesting that the Sulu Archipelago did not really act as a route between Borneo and Mindanao.

Compared with the total reptile fauna recorded from Mindanao, the collection discussed here is limited and we will not discuss its biogeography in more details. Unfortunately, in spite of its high species richness, Mindanao remains poorly explored on a herpetological basis. Great attention had been given to Western Mindanao (see TAYLOR, 1921, 1922a-b) and some isolated peaks of Central Mindanao, but many parts of the island had yet to see its reptile fauna surveyed. Nevertheless, the richness and high endemism of the fauna of Mindanao, as shown also by the present collection of reptiles, fully supports the creation of a national park (LAYS, 2005) to protect the remaining forests of Southwestern Mindanao.

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#### Literature cited

ALCALA, A. C., 1986. Guide to Philippine flora and fauna. Vol. X. Amphibians and reptiles. Manila, Natural Resources Management Center, Ministry of Natural Resources and University of the Philippines: i-xiv + 1-195.

ANONYMOUS, 1993. Growth Plan for South Cotabato / Sarangani / General Santos City. A Component of the Mindanao Development Project Funded by the United States Agency for International Development Under the Philippine Assistance Program. Unpublished document, Louis Berger International, Inc., General Santos City, Mindanao, Philippines.

ANONYMOUS, n.d. Nelles Map. Philippines. 1 : 1,500,000. Munich, Nelles Verlag GmbH.

AULIYA, M., MAUSFELD, P., SCHMITZ, A. & BÖHME, W., 2002. Review of the reticulated python (*Python reticulatus* Schneider, 1801) with the description of new subspecies from Indonesia. *Naturwissenschaften*, 89: 201-213.

BACON, J. P., 1980. A new *Tropidophorus* from the Philippine Islands. In: BROWN, W. C. & ALCALA, A. 1980. *Philippine Lizards of the Family Scincidae*. Dumaguete City, Silliman University Press: 229-233.

BAUER, A. M., 1994.. Familia Gekkonidae (Reptilia, Sauria). Part I Australia and Oceania. *Das Tierreich. The Animal Kingdom*, 109: i-xiv + 1-306, Berlin - New York, Walter de Gruyter:

BROWN, R. M., MCGUIRE, J. A., FERNER, J. W., ICARANGAL, N., JR. & KENNEDY, R. S., 2000. Amphibians and reptiles of Luzon Island, II: preliminary report on the herpetofauna of Aurora Memorial National Park, Philippines. *Hamadryad*, 25 (2): 175-195.

BROWN, W. C. & ALCALA, A. 1970. The zoogeography of the herpetofauna of the Philippine Islands, a fringing archipelago. *Proceedings of the California Academy of Sciences*, (4) 38 (6): 105-130.

BROWN, W. C. & ALCALA, A., 1978. Philippine Lizards of the Family Gekkonidae. *Natural Science Monograph Series*, 1: 1-146, Dumaguete City, Silliman University

BROWN, W. C. & ALCALA, A., 1980. Philippine Lizards of the Family Scincidae. *Natural Science Monograph Series*, 2: i-xi + 1-264. Dumaguete City, Silliman University

BROWN, W. C. & ALCALA, A., 1986. Comparison of the herpetofaunal species richness on Negros and Cebu Islands, Philippines. *Silliman Journal*, 33 (1-4): 74-86.

BROWN, W. C. & RABOR, D. S., 1967. Review of the genus *Brachymeles* (Scincidae), with descriptions of new species and subspecies. *Proceedings of the California Academy of Sciences*, (4) 34 (15): 525-548.

COLLINS, N. M., SAYER, J. A. & WHITMORE, T. C. (Eds), 1991. The Conservation Atlas of Tropical Forests. Asia and the Pacific. London-Basingstoke, MacMillan Press Ltd. and Gland, IUCN: 1-256.

DAS, I., 2004. Lizards of Borneo. Kota Kinabalu, Natural History Publications (Borneo) Sdn Bhd: i-v + 1-83.

DAVID, P. & VOGEL, G., 1996. The snakes of Sumatra. An annotated checklist and key with natural history notes. Frankfurt-am-Main, Edition Chimaira: 1-260.

DIONG, C. H. & LIM, S. S. L., 1998. Taxonomic review and morphometric description of *Bronchocela cristatella* (Kuhl, 1820) (Squamata: Agamidae) with notes on other species in the genus. *Raffles Bulletin of Zoology*, 46 (2): 345-359.

DOWLING, H. G. 1951. A proposed standard system of counting ventrals in snakes. *British Journal of Herpetology*, 1 (5): 97-99.

FERNER, J. W., BROWN, R. M., SISON, R. V. & KENNEDY, R. S., 2001. The Amphibians and Reptiles of Panay Island, Philippines. *Asiatic Herpetological Research*, 9: 34-70.

FISCHER, J. G. 1885a. Ichthyologische und herpetologische Bemerkungen. IV. Über eine Kollektion von Amphibien und Reptilien von Mindanao. *Jahrbuch der Hamburgischen wissenschaftlichen Anstalten*, 2: 80-81.



- FISCHER, J. G. 1885b. Ichthyologische und herpetologische Bemerkungen. V. Herpetologische Bemerkungen. *Jahrbuch der Hamburgischen wissenschaftlichen Anstalten.*, 2: 82-121, Pls. 3-5.
- GAULKE, M., 1989. Zur Biologie des Bindenwaranes, unter Berücksichtigung der paläogeographischen Verbreitung und der phylogenetischen Entwicklung der Varanidae. *Courier Forschungsinstitut Senckenberg*, 112: 1-242.
- GAULKE, M., 1991. Systematic relationships of the Philippine water monitors as compared with *Varanus s. salvator*, with a discussion of dispersal routes. *Mertensiella*, 2: 154-167.
- GAULKE, M., 1992. Taxonomy and biology of Philippine water monitors (*Varanus salvator*). *Philippine Journal of Science*, 121 (4): 345-381.
- GAULKE, M., 1993. Distribution, population density, and exploitation of the water monitor (*Varanus salvator*) in the Philippines. *Hamadryad*, 17 [1992]: 21-27.
- GAULKE, M., 1994a. Contribution to the snake fauna of the Sulu Archipelago, with the description of a new subspecies of *Dendrelaphis caudolineatus* (Gray, 1834). *Herpetological Journal, London*, 4 (4): 136-144.
- GAULKE, M., 1994b. Eine neue Unterart des Malaysischen Baumschnüfflers, *Ahaetulla prasina suluensis* n. subsp. (Reptilia: Serpentes: Colubridae). *Senckenbergiana Biologica*, 73 (1-2): 45-47.
- GAULKE, M., 1996. Die Herpetofauna von Sibutu Island (Philippinen), unter Berücksichtigung zoogeographischer und ökologischer Aspekte. *Senckenbergiana Biologica*, 75 (1-2): 45-56.
- GAULKE, M., 2001a. Die Herpetofauna von Sibaliw (Panay), einem der letzten Tieflandregenwaldgebiete der West-Visayas, Philippinen. Teil II: Schlangen. *Herpetofauna*, Weinstadt, 23 (131): 23-34.
- GAULKE, M., 2001b. Die Herpetofauna von Sibaliw (Panay), einem der letzten Tieflandregenwaldgebiete der West-Visayas, Philippinen. Teil III: Echsen und Diskussion. *Herpetofauna*, Weinstadt, 23 (132): 5-18.
- GAULKE, M., 2003. Übersicht der Philippinischen Gecko-fauna. *Gekkota*, 4: 3-24.
- GAULKE, M. & ALTENBACH, A. V., 1994. Contribution to the knowledge of the snake fauna of Masbate (Philippines). *Herpetozoa*, 7 (1/2): 63-66.
- GAULKE, M., DEMEGILLO, A., REITER, J. & TACUD, B., 2003. Additions to the herpetofauna of Panay Island, Philippines. *Salamandra*, 39 (1): 111-122.
- GAULKE, M. & FRITZ, U., 1998. Distribution patterns of batagurid turtles in the Philippines. *Herpetozoa*, 11 (1/2): 3-12.
- GUMPRECHT, A., 2001. Die Bambusottern der Gattung *Trimeresurus* Lacepède. Teil V: Die philippinischen Bambusottern I. Die Philippinen- oder Gelbflecken-Bambusotter *Trimeresurus flavomaculatus* (GRAY, 1842). *Sauria*, 23 (3): 3-14, Berlin.
- GUMPRECHT, A., TILLACK, F., ORLOV, N., CAPTAIN, A. & RYABOV, S., 2004. Asian Pitvipers. Berlin, Geitje Books: 1-368.
- HALLERMANN, J., 2006. A taxonomic review of the genus *Bronchocela* (Squamata: Agamidae), with description of a new species from Vietnam. *Russian Journal of Herpetology*, 12 [2005] (3): 167-182.
- HICKS, N., 2000. The national parks and other wild places of the Philippines. London-Cape Town-Sydney-Auckland, New Holland Publishers (UK) Ltd.: 1-176.
- INGER, R. F., 1954. Systematics and zoogeography of Philippine amphibia. *Fieldiana: Zoology*, 33: 183-531.
- INGER, R. F., 1983. Morphological and ecological variation in the flying lizards (genus *Draco*). *Fieldiana Zoology (New Series)*, 18: i-vi + 1-35.
- INGER, R. F. & MARX, H., 1965. The systematics and evolution of the colubrid snakes of the genus *Calamaria*. *Fieldiana: Zoology*, 49: 1-304.
- IVERSON, J. B. 1992. A revised checklist with distribution maps of the turtles of the world. Richmond (Indiana, USA), privately printed: i-xiii + 1-363.
- LAYS, P., 2000. Observations on *Donacia (Cyphogaster) javana* WIEDEMANN, 1821 (Coleoptera Chrysomelidae Donaciinae) in the Malay Archipelago. *Bulletin de la Société royale belge d'Entomologie*, 136 (1-6): 44-52.
- LAYS, P., 2001. Some informations on the ecology of Philippine Aleocharinae (Coleoptera Staphylinidae). *Bulletin de la Société royale belge d'Entomologie*, 137 (I-VI): 44-47.
- LAYS, P., 2005. Proposal for the creation of a New National Park in Southwestern Mindanao - Philippines. Unpublished document + 1 CD, C.E.L., Institut of Zoology, Liège, Belgium.
- LAYS, P., (Submitted). Rediscovery of a floral jewel in the Philippine Archipelago: *Rafflesia schadenbergiana* GÖPPER, 1885 (Rafflesiaceae). *Lejeunia*.
- LEVITON, A. E., 1963a. Contributions to a review of Philippine snakes, I. The snakes of the genus *Oligodon*. *Philippine Journal of Science*, 91 [1962] (4): 459-484.
- LEVITON, A. E., 1963b. Remarks on the zoogeography of Philippine terrestrial snakes. *Proceedings of the California Academy of Sciences*, (4) 31: 369-416.
- LEVITON, A. E., 1964. Contributions to a review of Philippine snakes, V. The snakes of the genus *Trimeresurus*. *Philippine Journal of Science*, 93 (2): 251-276.
- LEVITON, A. E., 1965a. Contributions to a review of Philippine snakes, VI. The snakes of the genus *Oxyrhabdium*. *Philippine Journal of Science*, 93 [1964] (3): 407-422.
- LEVITON, A. E., 1965b. Contributions to a review of Philippine snakes, VII. The snakes of the genera *Naja* and *Ophiophagus*. *Philippine Journal of Science*, 93 [1964] (4): 531-550.
- LEVITON, A. E., 1967. Contributions to a review of Philippine snakes, IX. The snakes of the genus *Cyclocorus*. *Philippine Journal of Science*, 94 [1965] (4): 519-533.
- LEVITON, A. E., 1968. Contributions to a review of Philippine snakes, X. The snakes of the genus *Ahaetulla*. *Philippine Journal of Science*, 96 (1): 73-90.
- LEVITON, A. E., 1970a. Contributions to a review of Philippine snakes, XII. The Philippines snakes of the genus *Dendrelaphis* (Serpentes: Colubridae). *Philippine Journal of Science*, 97 [1968] (4): 371-396.
- LEVITON, A. E., 1970b. Description of a new subspecies of *Rhabdophis auriculata* in the Philippines, with comments on the zoogeography of Mindanao Island. *Proceedings of the California Academy of Sciences*, (4) 38 (18): 347-361.
- LEVITON, A. E., 1977. Contributions to a review of Philippine snakes, XIII. The snakes of the genus *Elaphe*. *Philippine Journal of Science*, 106 (3-4): 99-128.
- LEVITON, A. E., 1983. Contributions to a review of Philippine snakes, XIV. The snakes of the genera *Xenopeltis*, *Zaocys*, *Psammodynastes* and *Myersophis*. *Philippine Journal of Science*, 112 (3-4): 195-223.
- MALHOTRA, A. & THORPE, R. S., 2004. A phylogeny of four mitochondrial gene regions suggests a revised taxonomy for Asian

pitvipers (*Trimeresurus* and *Ovophis*). *Molecular Phylogenetics and Evolution*, 32 (1): 83-100.

MALNATE, E. N. & UNDERWOOD, G., 1988. Australasian natricine snakes of the genus *Tropidonophis*. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 140 (1): 59-201.

MCCORD, W. P. & PHILIPPEN, H.-D., 1998. A new subspecies of Box Turtle, *Cuora amboinensis lineata*, from Northern Myanmar (Burma), with remarks on the distribution and geographic variation of the species. *Reptile Hobbyist*, 1998 (March): 51-58.

MCGUIRE, J. A. & ALCALA, A., 2000. A taxonomic revision of the Flying lizards (Iguania: Agamidae: *Draco*) of the Philippine Islands, with a description of a new species. *Herpetological Monographs*, 14: 81-138.

MUSTERS, C. J. M., 1983. Taxonomy of the genus *Draco* L. (Agamidae, Lacertilia, Reptilia). *Zoologische Verhandelingen*, 199: 1-120, Pls. 1-4.

NANCE, J., 1983. *The Gentle Tasaday: a Stone Age People in the Philippine Rain Forest*. Boston, David R. Godine: 1-484.

RASMUSSEN, J. B., 1975. Geographical variation, including an evolutionary trend, in *Psammodynastes pulverulentus* (Boie, 1827) (Boiginae, Homalopsidae, Serpentes). *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening*, 138: 39-64.

RUMMLER, H. J. & FRITZ, U., 1991. Geographische Variabilität der Amboina-Schermierschildkröte *Cuora amboinensis* (Daudin, 1802), mit Beschreibung einer neuen Unterart, *C. a. kamaroma* subsp. nov. *Salamandra*, 27 (1): 17-45.

SANDERS, K. L., MALHOTRA, A. & THORPE, R. S., 2004. Ecological diversification in a group of Indomalayan pitvipers (*Trimeresurus*): convergence in taxonomically important traits has implications for species identification. *Journal of Evolutionary Biology*, 17: 721-731.

SCHULZ, K.-D., 1996. *A Monograph of the Colubrid Snakes of the Genus Elaphe Fitzinger*. Havlickuv Brod (Czech Republic), Koeltz Scientific Books: i-iii + 1-439.

SMITH, B. E., 1993a. Notes on a collection of squamate reptiles from Eastern Mindanao, Philippine Islands Part 1: Lacertilia. *Asiatic Herpetological Research*, 5: 85-95.

SMITH, B. E., 1993b. Notes on a collection of squamate reptiles from Eastern Mindanao, Philippine Islands Part 2: Serpentes. *Asiatic Herpetological Research*, 5: 96-102.

SMITH, M. A., 1935. *The Fauna of British India, including Ceylon and Burma. Reptilia and Amphibia. Vol. II. - Sauria*. London, Taylor & Francis: i-xii + 1-440, Pl. 1.

TAYLOR, E. H., 1918. Two new snakes of the genus *Holarchus* with descriptions of other Philippine species. *Philippine Journal of Science*, 13 (6): 359-369, Pls. 1-2.

TAYLOR, E. H., 1921. Amphibians and turtles of the Philippine Islands. *Manila Bureau of Science, Publication*, 15: 1-193, Pls. 1-17.

TAYLOR, E. H., 1922a. The Snakes of the Philippine Islands. *Manila Bureau of Science, Publication*, 16: 1-312, Pls. 1-37.

TAYLOR, E. H., 1922b. Lizards of the Philippine Islands. *Manila Bureau of Science, Publication*, 17: 1-269, Pls. 1-23.

TAYLOR, E. H., 1922c. Additions to the herpetological fauna of the Philippine Islands, I. *Philippine Journal of Science*, 21 (2): 161-206, Pls. 1-7.

TAYLOR, E. H., 1922d. Additions to the herpetological fauna of the Philippine Islands, II. *Philippine Journal of Science*, 21 (3): 257-303, Pls. 1-4.

TAYLOR, E. H., 1923. Additions to the herpetological fauna of the Philippine Islands, III. *Philippine Journal of Science*, 22 (5): 515-557, Pls. 1-3.

TAYLOR, E. H., 1925. Additions to the herpetological fauna of the Philippine Islands, IV. *Philippine Journal of Science*, 26 (1): 97-111.

UTIGER, U., HELFENBERGER, N., SCHÄTTI, B., SCHMIDT, C., RUF, M. & ZISWILER, V., 2002. Molecular systematics and phylogeny of Old and New World ratsnakes, *Elaphe* auct., and related genera (Reptilia, Squamata, Colubridae). *Russian Journal of Herpetology*, 9 (2): 105-124.

UTIGER, U., SCHÄTTI, B. & HELFENBERGER, N., 2005. The oriental colubrine genus *Coelognathus* Fitzinger, 1843 and classification of Old and New World Racers and Ratsnakes (Reptilia, Squamata, Colubridae, Colubrinae). *Russian Journal of Herpetology*, 12 (1): 39-60.

VOGEL, G., 2006. *Venomous snakes of Asia - Giftschlangen Asiens*. Frankfurt am Main, Edition Chimaira & Rodgau, Aqualog Verlag ACS: 1-148.

WELCH, K. R. G., COOKE, P. S. & WRIGHT, A. S., 1990. Lizards of the Orient: a checklist. Robert F. Krieger Publ. Co, Malabar (Florida): i-vi + 1-162.

WERNSTEDT, F. & SPENCER, J. (Eds), 1967. *The Philippine Island World - A Physical, Cultural, and Regional Geography*. Berkeley, University California Press: 1-742.

WHITAKER, R. & CAPTAIN, A. 2004. *Snakes of India. The field guide*. Chennai, Draco Books: i-xiv + 481, Gazetteer pls. 1-4.

WICKER, R., GAULKE, M. & HORN, H.-G. 1999. Contributions to the biology, keeping and breeding of the Mindanao Water Monitor (*Varanus s. cumingi*). In: HORN, H.-G. & BÖHME, W. (Eds), *Advances in monitor research II, Mertensiella*, 11: 213-223.

WÜSTER, W. & THORPE, R. S., 1991. Asiatic cobras: systematics and snakebite. *Experientia*, 47: 205-209.

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Table 5. Comparison between the Reptile fauna of South Mindanao and adjacent areas.

Taxa	MS	MC	MN	MW	SU	EV	CV	WV	PA	MR	LU	SW	BO	AS
<b>CHELONII</b>														
<b>Bataguridae</b>														
<i>Cuora amboinensis</i> (DAUDIN, 1802)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>SQUAMATA</b>														
<b>Gekkonidae</b>														
<i>Cyrtodactylus annulatus</i> (TAYLOR, 1915)	X	X	X	X	X	X	X	X	X	-	-	-	-	-
<i>Gehyra mutilata</i> (WIEGMANN, 1834)	X	-	-	X	X	X	X	X	X	X	X	X	X	X
<b>Agamidae</b>														
<i>Bronchocela cristatella</i> (KUHL, 1820)	X	X	X	-	X	X	X	X	X	X	X	X	X	X
<i>Draco bimaculatus</i> GÜNTHER, 1864	X	-	X	X	X	X	X	-	-	-	-	-	-	-
<i>Draco mindanensis</i> STEJNEGER, 1908	X	X	X	X	-	X	-	-	-	-	-	-	-	-
<i>Gonocephalus semperi</i> (PETERS, 1887)	X	X	X	X	-	X	X	-	X	X	-	-	-	-
<b>Scincidae</b>														
<i>Brachymeles gracilis</i> (FISCHER, 1885)	X	X	X	-	X	X	X	-	-	-	-	-	-	-
<i>Eutropis indepressa</i> BROWN & ALCALA, 1980	X	-	-	-	X	X	X	X	X	X	X	-	X	-
<i>Eutropis multicolorata</i> (GRAY, 1845)	X	X	X	X	X	X	X	X	-	X	X	-	-	-
<i>Eutropis multifasciata</i> (KUHL, 1820)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Lamprolepis smaragdina</i> (LESSON, 1830)	X	X	-	X	X	X	X	X	X	X	X	X	-	-
<i>Lipinia auriculata</i> (TAYLOR, 1917)	X	-	X	-	-	X	X	-	-	X	X	-	-	-
<i>Lipinia subvittata</i> (GÜNTHER, 1873)	X	-	-	X	-	-	-	-	-	-	-	-	-	-
<i>Sphenomorphus fasciatus</i> (GRAY, 1845)	X	X	X	X	X	X	X	X	-	-	-	-	-	-
<i>Sphenomorphus mindanensis</i> TAYLOR, 1915	X	-	X	-	-	X	X	-	-	-	-	-	-	-
<i>Sphenomorphus variegatus</i> (PETERS, 1867)	X	X	X	X	X	X	X	-	-	-	-	-	-	-
<i>Tropidophorus davaoensis</i> BACON, 1980	X	X	-	-	-	-	-	-	-	-	-	-	-	-
<b>Varanidae</b>														
<i>Varanus salvator</i> (LAURENTI, 1768)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Total of Lizard species</b>	<b>18</b>	<b>12</b>	<b>13</b>	<b>12</b>	<b>12</b>	<b>16</b>	<b>15</b>	<b>9</b>	<b>8</b>	<b>9</b>	<b>8</b>	<b>5</b>	<b>5</b>	<b>4</b>
<b>Percentage of shared species (lizards)</b>	<b>-</b>	<b>66.7</b>	<b>72.2</b>	<b>66.7</b>	<b>66.7</b>	<b>88.9</b>	<b>83.3</b>	<b>50.0</b>	<b>44.4</b>	<b>50.0</b>	<b>44.4</b>	<b>27.8</b>	<b>27.8</b>	<b>22.2</b>

Taxa	MS	MC	MN	MW	SU	EV	CV	WV	PA	MR	LU	SW	BO	AS
<b>Pythonidae</b>														
<i>Python reticulatus</i> (SCHNEIDER, 1801)	X	-	-	X	X	X	X	X	X	X	X	X	X	X
<b>Colubridae</b>														
<i>Ahaetulla prasina</i> (BOIE, 1827)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Calamaria gervaisi</i> DUMÉRIL, BIBRON & DUMÉRIL, 1854	X	X	X	X	-	-	X	X	-	X	X	-	-	-
<i>Calamaria lumbricoidea</i> (H. BOIE in F. BOIE, 1827)	X	X	X	X	-	-	X	X	-	-	-	-	X	X
<i>Coelognathus erythrura</i> (DUMÉRIL, BIBRON & DUMÉRIL, 1854)	X	X	X	X	X	X	X	X	X	X	X	X	-	-
<i>Cyclocorus nuchalis</i> TAYLOR, 1923	X	-	-	X	-	X	-	-	-	-	-	-	-	-
<i>Dendrelaphis caudolineatus</i> (GRAY, 1834)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Oligodon maculatus</i> (TAYLOR, 1918)	X	X	X	-	-	-	-	-	-	-	-	-	-	-
<i>Oxyrhabdium modestum</i> (DUMÉRIL, BIBRON & DUMÉRIL, 1854)	X	X	X	X	-	X	X	-	-	-	-	-	-	-
<i>Psammodynastes pulverulentus</i> (H. BOIE in F. BOIE, 1827)	X	X	X	X	X	X	X	X	X	-	X	X	X	X
<i>Rhabdophis auriculatus</i> (GÜNTHER, 1858)	X	X	X	X	-	X	X	-	-	-	X	-	-	-
<i>Rhabdophis lineatus</i> (PETERS, 1861)	X	-	X	X	-	X	X	-	-	-	-	-	-	-
<i>Tropidonophis dendrophiops</i> (GÜNTHER, 1883)	X	X	X	X	-	X	X	-	-	-	-	-	-	-
<b>Elapidae</b>														
<i>Naja samarensis</i> PETERS, 1861	X	X	X	X	-	X	X	-	-	-	-	-	-	-
<i>Ophiophagus hannah</i> (CANTOR, 1836)	X	X	X	-	X	-	X	X	-	X	X	X	X	X
<b>Viperidae</b>														
<i>Parias flavomaculatus</i> (GRAY, 1842)	X	X	X	X	X	X	X	X	-	X	X	-	-	-
<b>Total of Snake species</b>	<b>16</b>	<b>13</b>	<b>14</b>	<b>14</b>	<b>7</b>	<b>12</b>	<b>14</b>	<b>9</b>	<b>5</b>	<b>6</b>	<b>9</b>	<b>6</b>	<b>6</b>	<b>6</b>
<b>Percentage of shared species (snakes)</b>	<b>-</b>	<b>81.3</b>	<b>87.5</b>	<b>87.5</b>	<b>43.8</b>	<b>75.0</b>	<b>83.3</b>	<b>56.3</b>	<b>31.2</b>	<b>37.5</b>	<b>56.3</b>	<b>37.5</b>	<b>37.5</b>	<b>37.5</b>
<b>TOTAL</b>	<b>35</b>	<b>26</b>	<b>28</b>	<b>27</b>	<b>20</b>	<b>29</b>	<b>30</b>	<b>19</b>	<b>14</b>	<b>17</b>	<b>18</b>	<b>12</b>	<b>12</b>	<b>11</b>
<b>Percentage of species shared with Lake Sebu area</b>	<b>-</b>	<b>74.3</b>	<b>80.0</b>	<b>77.1</b>	<b>57.1</b>	<b>82.9</b>	<b>85.7</b>	<b>54.3</b>	<b>40.0</b>	<b>48.6</b>	<b>51.4</b>	<b>34.3</b>	<b>34.3</b>	<b>31.4</b>