

ZOO INDONESIA

Jurnal Fauna Tropika

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Cibinong, Nopember 2006

Redaksi

**THE AMPHIBIANS SPECIES IN GUNUNG HALIMUN NATIONAL PARK,
WEST JAVA, INDONESIA**

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ABSTRAK

Kurniati. H. 2006. Jenis-jenis amfibi di Taman Nasional Gunung Halimun, Jawa Barat. Zoo Indonesia. Vol. 15 (2): 107-120. Lima suku kodok yang terdapat di Jawa dijumpai di Taman Nasional Gunung Halimun. Kelima suku tersebut adalah: Megophryidae, Bufonidae, Microhylidae, Ranidae dan Rhacophoridae. Suku Bufonidae terdiri dari dua anak suku, yaitu Adenominae dan Bufoninae. Suku Microhylidae hanya terdiri dari satu anak suku, Microhylinae; sedangkan suku Ranidae terdiri dari dua anak suku, yaitu Raninae dan Dicroglossinae. Jenis fauna kodok di Taman Nasional Gunung Halimun termasuk kaya, karena dijumpai 25 jenis dari 33 jenis kodok asli Jawa. Selama survei herpetofauna yang dilakukan pada bulan Oktober 2001 sampai Agustus 2002, 25 jenis kodok dijumpai di Taman Nasional Gunung Halimun, yang terdiri dari dua jenis dari suku Megophryidae, lima jenis dari suku Bufonidae, satu jenis dari suku Microhylidae, 12 jenis dari suku Ranidae dan lima jenis dari suku Rhacophoridae. Di antara 33 jenis kodok asli Jawa, delapan jenis merupakan jenis endemik; enam dari ke delapan jenis endemik tersebut terdapat di Taman Nasional Gunung Halimun. Ke enam jenis tersebut adalah: Leptophryne cruentata, Microhyla achatina, Huia masonii, Nyctyxalus margaritifer, Philautus vittiger dan Rhacophorus javanus. Di Taman Nasional Gunung Halimun dua tipe makro habitat kodok yang umum dijumpai adalah hutan primer dan habitat terganggu. Habitat hutan primer adalah habitat di mana kodok jenis Leptobrachium hasseltii, Leptophryne borbonica, L. cruentata, Huia masonii, Rana hosii, Limnnectes microdiscus, N. margaritifer, P. aurifasciatus dan P. vittiger sangat tergantung pada habitat ini. Habitat terganggu karena intervensi manusia meliputi hutan sekunder, hutan terdegradasi, kebun atau sawah, di mana lebih dari separuh jenis kodok dijumpai pada habitat ini.

Kata kunci: amfibia, kodok, Taman Nasional Gunung Halimun.

ABSTRACT

Kurniati. H. 2006. The amphibians species in Gunung Halimun National Park, West Java. Zoo Indonesia Vol. 15 (2): 107-120. Five families of frog that exist in Java are represented in Gunung Halimun National Park: the Megophryidae, the Bufonidae, the Microhylidae, the Ranidae and the Rhacophoridae. In the park, the Bufonidae consists of two subfamilies, the Adenominae and the Bufoninae. The Microhylidae only has one subfamily, the Microhylinae, whereas the Ranidae consists of two subfamilies, the Raninae and the Dicroglossinae. Frog fauna in Gunung Halimun National Park is comparatively rich, including 25 species of the 33 species of native javan frogs. During herpetofauna survey in October 2001 to August 2002, twenty-five species of amphibian were found in Gunung Halimun National Park; they consist of two species of the Megophryidae, five species of the Bufonidae, one species

of the *Microhylidae*, twelve species of the *Ranidae* and five species of the *Rhacophoridae*. Among 33 species of the native javan frogs, eight species are endemic to Java; however six species of the endemic species are inhabited in the park; they are *Leptophryne cruentata*, *Microhyla achatina*, *Huia masonii*, *Nyctyalus margaritifera*, *Philautus vittiger* and *Rhacophorus javanus*. In Gunung Halimun National Park, two major type macro habitats of frog are generally recognized. One major type macro habitat is primary forest, where *Leptobranchium hasseltii*, *Leptophryne borbonica*, *L. cruentata*, *Huia masonii*, *Rana hosij*, *Limnonectes microdiscus*, *N. margaritifera*, *P. aurifasciatus* and *P. vittiger* are very restricted to this habitat. Another type is disturbed habitat, where human has intervened the habitat as secondary forest, degraded forest, cultivation or paddy field. More than half frogs species occur in these habitats.

Keywords: amphibian, frog, Gunung Halimun National Park.

INTRODUCTION

Gunung Halimun National Park lies about 100 km southwest of Jakarta (Figure 1), at altitudes between 500-2000 meters above sea level (asl). The highest point is the peak of Gunung Halimun with a height of 1929 meters asl. Covering 40.000 hectares, this area is the largest sub-mountain forest in West Java. The park is classified into four types of habitat: lowland forest, sub-mountain forest, upland crop and bush. Based on analysis of aerial photographs, the vegetation was divided into primary forest, secondary forest, cultivated areas and tea plantations. Primary forest covers nearly 70% of the park area (Nijjima 1997).

The park herpetofauna (amphibians and reptiles) has never been reviewed systematically. Intensive herpetofaunal surveys were conducted in Ujung Kulon National Park in 1990 (Kurniati et al. 2001); Liem (1973) surveyed the amphibians in Gede-Pangrango National Park. In order to provide comprehensive coverage of the national parks in West Java, I have been conducting an intensive herpetofauna survey, with an emphasis on amphibians, in Gunung Halimun National Park since October 2001. This survey also obtained basic ecological information on all species of amphibians in the park in order to assist park staff with the management and protection of the park's interesting herpetofauna.

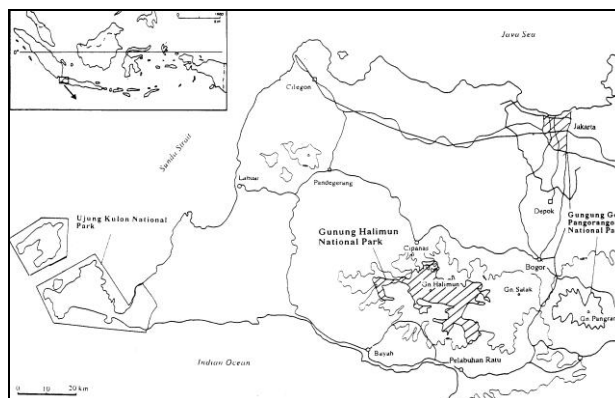


Figure 1. Location of Ujung Kulon, Gunung Halimun and Gede-Pangrango National Park (Map courtesy from Anonymous 1997).

MATERIAL & METHODS

Survey sites

The study areas were located in ten survey sites (Figure 2), where the altitudes between 700 meters to 1900 meters above sea level (asl). The study sites elevation of Citalahab, Cikaniki, and Cianten were at elevation 1000 meters asl; Cibunar, Gunung Wangun, Gunung Bedil and Cigadog are between 700 to 1200 meters asl; Cikeris, Legok Karang and Gunung Botol were between 1500 to 1900 meters asl. In the ten study sites, seven habitat types were found. Citalahab, Cikaniki and Cigadog consist of rain forest, edificarian and cultivated land; Cianten, Gunung Wangun, Gunung Bedil and consist of disturbed forest, secondary vegetation, ruderal and edificarian; whereas Cibunar, Cikeris, Legok Karang and Gunung Botol consist of rain forest and cloud forest. The average daily temperature was 25⁰C and at night between 15⁰C to 20⁰C. Relative humidity averages 70% to 85%. Brief descriptions of the habitats as follow :

1. Edificarian : Building and other manmade structures of wood, stone, concrete and other materials provide an important habitat especially for some gecko special that were commensally with humans.
2. Ruderal : This habitat consists of grassy, weedy areas usually near settlements and adjacent to human habitation, includes roadsides ditch.
3. Cultivated land : Paddy field and tea plantations were dominant in this area.
4. Disturbed forest : Disturbed forest occurs frequently between 700 to 1000 meters asl, where many of native trees have been selective cut and the under story had been

cleared or modified by human activity directly or by livestock.

5. Secondary vegetation : This habitat consists mainly of thickets of small trees, shrubs and vines where the forest has been more severely disturbed, and most of the mature trees had been removed.
6. Rainforest : This was the most widespread and abundant vegetation type on the main area of Gunung Halimun National Park, ranging from 1000 meters to 1500 meters asl. Tree ferns were common in this habitat, especially at the higher elevation.
7. Cloud forest : This vegetation type known as moss forest, usually above 1500 meters asl. Mosses and fern festoon the trunks, limbs and branches of trees and shrubs, and they provide much of the ground cover.

1. Amphibian species diversity

The suitable techniques for collecting the species were :

- a. Catching by hand:
This technique was suitable for frogs inhabiting microhabitats such as leaf litter, tree bark and buttresses, low-lying vegetation and in or under logs.
- b. Lighting:
This technique was used to catch frogs in the night using a powerful flashlight. The frogs were temporary blinded when the flashlight shines in their eyes, making them easy to catch.

Altitude and microhabitat were recorded when the frog found in every survey sites. All specimens were killed by injecting 96% ethanol into the brain and fixed in 10% formalin and preserved in 70% alcohol.

2. Species richness & relative abundance

This technique was utilized manual sighting in a certain time sequence. It was applied to different habitat among several sample sites throughout Gunung Halimun National Park. The abundance rating was based on the following scale (Buden, 2000):

a. Common: at least 30 sightings/day in suitable habitat and under optimal weather conditions.

- b. Fairly common : 10-30 sighting/day.
- c. Uncommon : up to 10 sightings/day on most days.
- d. Scarce : up to 5 sighting/day.
- e. Rare : under 5 sighting in most of time surveys.

Identification of all species follows the taxonomy of Inger (1966), Iskandar (1998), Liem (1973), Van Kampen (1923) and Yang (1991).

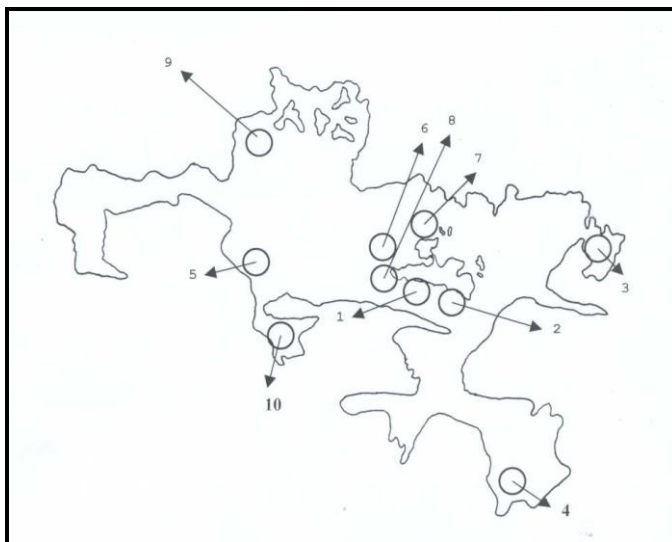


Figure 2. Ten survey sites of herpetofauna diversity study in Gunung Halimun National Park. (1) Citalahab; (2) Cikaniki; (3) Cianten; (4) Cigadog; (5) Cibunar; (6) Gunung Botol; (7) Legok Karang; (8) Cikeris; (9) Gunung Wangun; (10) Gunung Bedil.

RESULTS & DISCUSSION

Five families of frog that exist in Java were represented in Gunung Halimun National Park: the Megophryidae, the Bufonidae, the Microhylidae, the Ranidae and the Rhacophoridae. In the park, the Bufonidae consisted of two subfamilies, the Adenominae and the Bufoninae. The Microhylidae only had one subfamily, the Microhyliinae, whereas the Ranidae consisted of two

subfamilies, the Raninae and the Dicroglossinae. Frog fauna in Gunung Halimun National Park was comparatively rich, including 24 species of the 33 species of native Javan frogs. Twenty-five species of amphibian in Gunung Halimun National Park consisted of two species of Megophryidae, five species of Bufonidae, one species of Microhylidae, twelve species of

Ranidae and five species
Rhacophoridae.

Species Accounts :

**AMPHIBIA
ANURA**

A. Family MEGOPHRYIDAE

***Leptobrachium hasselti* Tschudi,
1838**

Ecological notes : *Leptobrachium hasselti* is restricted to primary forest of the main area of Gunung Halimun National Park. They can be found on the forest floor, under shrubs and among leaf litter around Cikaniki Trail and Loop Trail in the Cikaniki and Citalahab areas.

Abundance rating : The frogs are found fairly common at Cikaniki and Loop Trails.

Vertical distribution : These frogs have been observed on the forest floor at elevations from sea level in Ujung Kulon National Park (Kurniati et al. 2001) to 1200 meters asl in Gunung Halimun National Park and Gede-Pangrango National Park (Liem 1973).

***Megophrys montana* Kuhl & van
Hasselt, 1822**

Ecological notes : *Megophrys montana* is a mountain forest frog that usually forages on the forest floor. In Gede-Pangrango the frogs are restricted to primary rainforest (Liem 1973), but in Gunung Halimun the this species has a wide distribution and can be found in primary, secondary or disturbed forest.

Abundance rating : In Gunung Halimun the frog is common.

Vertical distribution : In Gunung Halimun the frogs can be found at elevation 800 to 1700 meters asl (Gunung Botol).

**B. Family BUFONIDAE
B.1. Subfamily ADENOMINAE**

***Leptophryne borbonica*
(Kuhl & van Hasselt, 1827)**

Ecological notes : *Leptophryne borbonica* is a primary forest frog, they are found at slow moving water at Cikaniki and Loop Trails in the Citalahab and Cikaniki areas.

Abundance rating : At Cikaniki and Loop Trails the frog is common.

Vertical distribution : The species is found between 600 to 1500 meters asl in Kalimantan (Inger 1963); but in Gunung Halimun National Park, this frog can be found in abundance at 1000 to 1200 meters asl.

***Leptophryne cruentata*
(Tschudi, 1838)**

Ecological notes : *Leptophryne cruentata* is a primary forest frog, they are found at stream bank of fast moving water at Cikeris primary forest areas.

Abundance rating : At Cikeris the frog is scarce (only 5 individuals were recorded).

Vertical distribution : The species is found at 1500 meters asl. In Gede-Pangrango National Park, they found in Cibeureum waterfall at the elevation above 1000 meters but less than 2000 meters asl (Liem 1973).

Note : This species was listed as Endangered under criterion B1ab(v) (IUCN, Conservation International and Nature Serve 2004).

B.2. Subfamily BUFONINAE

Bufo asper Gravenhorst, 1829

Ecological notes : *Bufo asper* occurs along the banks of rivers, creeks and small streams in primary and secondary forest, but sometimes they are found in small streams near paddy fields or human habitation. In Ujung Kulon the frogs occur in *Nypa* mangroves on riverbanks in the Cijungkulon area near the sea (Kurniati et al. 2001). In Gede-Pangrango (Liem 1973) and Gunung Halimun the frogs usually occur along in riparian habitats within primary and secondary forest. In some places in Gunung Halimun the frog is found at small streams close to paddy fields or human habitations.

Abundance rating : In Gunung Halimun the abundance of the frog depends on altitude; it is common at elevations around 800 meters asl.

Vertical distribution : The species can be found from sea level (Kurniati et al. 2001) to 1000 meters asl.

Bufo biporcatus Gravenhorst, 1829

Ecological notes : *Bufo biporcatus* is usually found in degraded habitat. In Ujung Kulon this frog is found in marshy *Chrysopogon* dominated Banteng grazing area near Cigenter River (Kurniati et al. 2001). In Gede-Pangrango it is restricted to Rarahan, along village clearings or footpaths (Liem 1973). In Gunung Halimun it is widespread in footpaths along tea plantation, fishponds or in human habitation at elevations 600-1000 asl; they are never abundant.

Abundance rating : The frog is rare (under 5 sightings) in Ujung kulon

(Kurniati et al. 2001); It is uncommon in Gede-Pangrango (Liem 1973) and Gunung Halimun.

Vertical distribution : The frog can be found from sea level in Ujung Kulon (Kurniati et al. 2001) to 1500 meters from sea level (Liem 1973). In Gunung Halimun it is usually found at elevations between 600 to 1000 meters asl.

Bufo melanostictus Schneider, 1799

Ecological notes : *Bufo melanostictus* is never found in primary, secondary or degraded forest; they usually found close to or in human habitations. This is why it is absent from Ujung Kulon (Kurniati et al. 2001). In Gunung Halimun the frogs have a widespread distribution.

Abundance rating : They are common in low elevation (600 asl), but rare at high elevations (1500 asl).

Vertical distribution : The frog can be found from sea level up to 1500 meters asl. It is relatively rare at high altitudes.

C. Family MICROHYLIDAE Subfamily MICROHYLINAE

Microhyla achatina Tschudi, 1838

Ecological notes : *Microhyla achatina* in Gede-Pangrango and Gunung Halimun has not been found in primary or secondary forest, but in Ujung Kulon the frog is widespread throughout wet areas, swamps and damp leaf litter in primary forest (Kurniati et al. 2001). In Gede-Pangrango this species is found on the banks of quiet pools or in water-filled ditches along the road to Rarahan (Liem 1973). In Gunung Halimun it is widespread in the main part of

the national park, concentrated on banks along slow moving water, fishponds or paddy fields. In Citalahab and Gunung Botol this frog occurs in grassy peat swamps close to tea plantations.

Abundance rating : It is fairly common in Gunung Halimun.

Vertical distribution : *Microhyla achatina* is endemic to Java. It can be found from sea level up to 1500 meters asl (Liem 1973). In Gunung Halimun, it is abundant at elevations from 800 to 1000 meters asl.

D. Family RANIDAE

D.1. Subfamily RANINAE

***Huia masonii* (Boulenger, 1884)**

Ecological notes : *Huia masonii* is restricted to primary or secondary forest along swift or fast-moving mountain streams. Individuals usually sit on rocks, boulders or vegetation along streams.

Abundance rating : In Gunung Halimun it is common to about 1000 meters asl.

Vertical distribution : *Huia masoni* is endemic species to Java. In Gede-Pangrango the species occurs up to 2000 meters asl (Liem 1973), but in Gunung Halimun it occurs at elevations from 800 to 1000 meters asl.

***Rana chalconota* (Schlegel, 1837)**

Ecological notes : In Gede-Pangrango (Liem 1973) and Gunung Halimun *Rana chalconota* has not been found in the forest. In Gunung Halimun it occurs in slow-moving water, fishponds or paddy fields. In Citalahab this frog is found in grassy peat swamps inside tea plantations.

Abundance rating : Common in Gede-Pangrango (Liem 1973) and Gunung Halimun.

Vertical distribution : In Java, the frog occurs from sea level up to 1500 meters asl (Liem 1973). In Gunung Halimun National Park, this frog is very common at elevations from 1000 to 1200 meters asl.

***Rana erythraea* (Schlegel, 1837)**

Ecological notes : *Rana erythraea* usually occurs in ponds with aquatic vegetation (Alcala & Brown 1998), disturbed freshwater habitats such as irrigation ditches (Inger & Stuebing 1989) or in stagnant water in lakes, ponds or paddy fields at less than 250 meters asl (Iskandar 1998). In Gunung Halimun the frog is found only in paddy field that are harvested once a year in Gunung Wangun area (Muhara Resort).

Abundance rating : In Gunung Halimun this frog is uncommon

Vertical distribution : In Gunung Halimun, the frog is found at elevation 700-900 meters asl.

***Rana hosii* Boulenger, 1891**

Ecological notes : *Rana hosii* is restricted to primary or secondary forest along swift or fast-moving mountain streams. In Gunung Halimun it lives sympatrically with *Huia masonii*.

Abundance rating : In Gunung Halimun the frog is common in restricted areas.

Vertical distribution : In Kalimantan the frog can be found at elevations about 300 to 1200 meters asl (Inger 1966). In Gunung Halimun National Park, it is abundant to about 1000 meters asl.

Rana nicobariensis
(Stoliczka, 1870)

Ecological notes : *Rana nicobariensis* in Gunung Halimun is found in paddy fields, roadside ditches or cultivated areas; but in Ujung Kulon the frog found in the forest, widespread throughout the main parts of Ujung Kulon (Kurniati et al. 2001).

Abundance rating : The frog is common in Gunung Halimun and also in Ujung Kulon (Kurniati et al. 2001) and Gede-Pangrango (Liem 1973).

Vertical distribution : In Gunung Halimun the frog is abundant in paddy field at elevations from 600 to 1000 meters asl.

D.2. Subfamily DICROGLOSSINAE

***Fejervarya cancrivora* Gravenhorst,**
1829

Ecological notes : *Fejervarya cancrivora* at Gede-Pangrango (Liem 1973) and Gunung Halimun does not occur in rainforest; but in Ujung Kulon it is found in primary forest at swamps near Jamang and to the south of the mouth of the Cigarter River (Kurniati et al. 2001). This frog is tolerates salinities up to 2,8 ‰ (Alcala & Brown 1998). They occur in freshwater and brackish pools (Alcala & Brown 1998). In Gunung Halimun the frog is usually found in paddy field, they live sympatrically with *Fejervarya limnocharis*.

Abundance rating : It is common in Gunung Halimun, Ujung Kulon (Kurniati et al. 2001) and Gede-Pangrango (Liem 1973).

Vertical distribution : These frogs are abundant from sea level to 1000 meters asl.

***Fejervarya limnocharis* Boie,**
1835

Ecological notes : *Fejervarya limnocharis* in Gunung Halimun and Gede-Pangrango (Liem 1973) does not occur in rainforest, but in Ujung Kulon this species is widespread throughout the main parts of the park in or near freshwater (Kurniati et al. 2001). In Gunung Halimun this frog is usually found in roadside ditches, fishponds, paddy fields and in any temporary pools.

Abundance rating : Common at Gunung Halimun, Ujung Kulon (Kurniati et al. 2001) and Gede-Pangrango (Liem 1973).

Vertical distribution : These frogs can be found from sea level to 1500 meters asl. In Gunung Halimun, it is very abundant between elevation 600 to 1000 meters asl.

Limnonectes kuhlii
(Tschudi, 1838)

Ecological notes : *Limnonectes kuhlii* is a mountain frog and is usually found in stagnant or slow-moving water in shaded places. In Gede-Pangrango the frog is restricted to rainforest habitats (Liem 1973). In Gunung Halimun it occurs in slow-moving water in primary, secondary or degraded forests or in open areas. In Citalahab it occurs in grassy peat swamp in tea plantation.

Abundance rating : Common in Gunung Halimun at

elevations about 1000 meters
asl.

Vertical distribution : In Gunung Halimun it can be found at elevation between 1000 to 1500 meters asl; but it is most abundant at elevations of about 1000 asl.

***Limnonectes macrodon*
(Dumeril & Bibron, 1841)**

Ecological notes : *Limnonectes macrodon* does not occur in rain forest at Gunung Halimun. In Ujung Kulon it has been recorded only along the lighthouse trail and about 5 km south of Cidaun, they occur in freshwater and brackish pools (Kurniati et al. 2000). In Gunung Halimun the frog is found in paddy fields, fast-moving water, slow-moving water or stagnant pools.

Abundance rating : In Ujung Kulon the frog is found occasionally (5-20 sightings) (Kurniati et al. 2001), but it is common in Gunung Halimun.

Vertical distribution : In Gunung Halimun, the frogs are abundant at elevation from 600 to 1000 meters asl.

***Limnonectes microdiscus*
(Boettger, 1892)**

Ecological notes : *Limnonectes microdiscus* is restricted to the rainforest, and is usually found in a temporary pools or stagnant water. This species is never found in swift moving creeks or streams. It is widespread throughout mainland Ujung Kulon, where it is found in or near freshwater (Kurniati et al. 2001). In Gunung Halimun the frog is

never abundant in temporary pools or stagnant water.

Abundance rating : Common in Gunung Halimun, Ujung Kulon (Kurniati et al. 2001) and Gede-Pangrango (Liem 1973).

Vertical distribution : These frogs can be found from sea level (Kurniati et al. 2001) up to 1500 meters asl (Liem 1973).

***Occidozyga sumatrana*
(Peters, 1877)**

Ecological notes : *Occidozyga sumatrana* is usually found in puddles among human habitation, in forest or secondary clearings (Iskandar 1998). In Ujung Kulon it is found in marshy areas near Jamang and the mouth of Cigenter River (Kurniati et al. 2001). In Gunung Halimun it occurs in muddy pool close to human habitation and in paddy fields.

Abundance rating : In Ujung Kulon the frog is occasionally found (5-20 sightings) (Kurniati et al. 2001); but in Gunung Halimun it is rare (under 5 sightings). According to Iskandar (1998), this species has never been found in high numbers, although it is not rare.

Vertical distribution : These frogs can be found at sea level in Ujung Kulon (Kurniati et al. 2001) to 700 meters asl. In Gunung Halimun it is found at elevations above 700 meters elevation.

E. Family RHACOPHORIDAE

***Nyctixalus margaritifer* (Boulenger,
1882)**

Ecological notes : *Nyctixalus margaritifer* is an endemic frog

to Java. In Gunung Halimun it occurs in primary forest, where it lives among shrubs that are close to water.

Abundance rating : In Gunung Halimun this frog is rare.

Vertical distribution : It is usually found in rainforest from the lowlands up to about 1200 meters asl (Iskandar 1998). In Gunung Halimun it occurs at elevations up to about 1000 meters asl.

Note : The species is listed as vulnerable because its extent of occurrence is less than 20,000 km², its distribution is severely fragmented, and there is continuing decline in the extent and quality of its forest habitat in Java (IUCN, Conservation International, and Nature Serve 2004).

Philautus aurifasciatus
(Schlegel, 1837)

Ecological notes : *Philautus aurifasciatus* is a mountain tree frog, it is only found in the forests and away from streams or pools. In Gunung Halimun It lives among shrubs in mossy forest, and usually found on the leaf about one meters above the ground.

Abundance rating : Common in mossy forest on Gunung Botol within Gunung Halimun National Park at elevations at about 1700 meters asl.

Vertical distribution : In Kalimantan, this species can be found at elevations of about 1000 to 3000 meters asl (Inge 1966). In Gunung Halimun these frogs were found at elevations from 1000 to 2000 meters asl.

Philautus vittiger (Boulenger, 1897)

Ecological notes : *Philautus vittiger* is endemic to Java. The frog has only been found among vegetation in humid shrubby areas (Iskandar 1998). During field surveys in Gunung Halimun, the frog was found only at Loop trail in the Citalahab area; they sit on leaves among shrubs that are close to water inside primary forest.

Abundance rating : In Gunung Halimun this frog is rare.

Vertical distribution : In Gunung Halimun it is found at elevations above 1000 meters asl. The type locality of the species is Pangalengan, West Java at an elevation 1200 meters asl (Van Kampen 1923).

Polypedates leucomystax
(Gravenhorst, 1829)

Ecological notes : *Polypedates leucomystax* is the most common tree frog in Java. In the lowland, this species is abundant and usually occurs near human habitations, in cultivated land around fishpond or permanent pools. In Gunung Halimun, the frog was found in temporary pond close to paddy field in Cisitu, Ciparay Resort. In Gede-Pangrango the frog was only found in Cibodas Botanical Garden, has non been found in mainland Gede-Pangrango National Park (Liem 1973). In Ujung Kulon the frog was found widespread throughout mainland Ujung Kulon, they live in low vegetation, especially above or near freshwater (Kurniati et al. 2001).

Abundance rating : Abundant rating of this frog is depend on altitude. In Gunung Halimun and Gede-Pangrango (Liem 1973) the frog is rare, but in Ujung Kulon the frog is common (Kurniati et al. 2001).

Vertical distribution : In Java *P. leucomystax* has a very extensive vertical distribution from the coast up to 1500 meters asl (Liem 1973).

***Rhacophorus javanus* Boettger,
1893**

Ecological notes : *Rhacophorus javanus* is an endemic frog to Java. This tree frog can be found in rainforest or open areas. In Ujung Kulon this species is found in lighthouse trail area near Cidaun, where it occurs among low vegetation in *Arenga* and *Calamus* forests (Kurniati et al. 2001). In Gede-Pangrango the frog is usually found in pools or in slow moving water on water plants or shrubs in primary forest as well as in open areas such as the Botanical Garden (Liem 1973). In Gunung Halimun it occurs among shrubs that are close to slow-moving water in primary forest; it is also found among shrubs in open areas such as tea plantation or peat swamp that are close to water.

Abundance rating : in Ujung Kulon the frog is rare (Kurniati et al. 2001), but in Gunung Halimun and Gede-Pangrango (Liem 1973) it is common.

Vertical distribution : This from occurs from the lowlands to about 1700 meters asl.

***Rhacophorus reinwardtii*
(Schlegel, 1840)**

Ecological notes : In Gunung Halimun and Gede-Pangrango (Liem 1973), *Rhacophorus reinwardtii* is a tree-dweller; it is usually found 2 to 3 meters high in trees or shrubs along quiet pools. In Gunung Halimun it is found in degraded forest and also found among tea plantations that are close to water at elevations from 600 to 1000 meters asl.

Dimensions of snout to vent length : Adult male 40-56 mm ; adult female 65-79 mm.

Abundance rating : In Gunung Halimun and Gede-Pangrango (Liem 1973) the species is common.

Vertical distribution : The frog has an extensive vertical distribution, from sea level up to 1500 meters asl (Liem 1973).

Five families of frog that exist in Java are represented in Gunung Halimun National Park : the Megophryidae, the Bufonidae, the Microhylidae, the Ranidae and the Rhacophoridae. In the park, the Bufonidae consists of two subfamilies, the Adenominae and the Bufoninae. The Microhylidae only has one subfamily, the Microhyliinae, whereas the Ranidae consists of two subfamilies, the Raninae and the Dicroglossinae. Frog fauna in Gunung Halimun National Park is comparatively rich, including 25 species of the 33 species of native Javan frogs; 25 frogs species in the park consist of two species of Megophryidae, five species of Bufonidae, one species of Microhylidae, 12 species of Ranidae and five species of Rhacophoridae (Table 1).

Table 1. Families, subfamilies and species of frogs in Java and in Gunung Halimun National Park.

Family	Subfamily	Species in Java	Species in Gunung Halimun National Park
Megophryidae		<i>Leptobrachium hasseltii</i>	+
		<i>Megophrys Montana</i>	+
Bufonidae	Adenominae	<i>Leptophryne borbonica</i>	+
		<i>Leptophryne cruentata</i> *	+
	Bufoninae	<i>Bufo asper</i>	+
		<i>Bufo biporcatus</i>	+
		<i>Bufo melanostictus</i>	+
		<i>Bufo parvus</i>	-
Microhylidae	Microhyliinae	<i>Kalophrynus minusculus</i>	-
		<i>Kalophrynus pleurostigma</i>	-
		<i>Kaloula baleata</i>	-
		<i>Microhyla achatina</i> *	+
		<i>Microhyla palmipes</i>	-
Ranidae	Raninae	<i>Huia masonii</i> *	+
		<i>Rana chalconota</i>	+
		<i>Rana erythraea</i>	+
		<i>Rana hosii</i>	+
		<i>Rana nicobariensis</i>	+
	Dicroglossinae	<i>Fejervarya cancrivora</i>	+
		<i>Fejervarya limnocharis</i>	+
		<i>Limnonectes kuhlii</i>	+
		<i>Limnonectes macrodon</i>	+
		<i>Limnonectes microdiscus</i>	+
		<i>Occidozyga lima</i>	-
		<i>Occidozyga sumatrana</i>	+
Rhacophoridae		<i>Nyctixalus margaritifer</i> *	+
		<i>Philautus aurifasciatus</i>	+
		<i>Philautus jacobsoni</i> *	-
		<i>Philautus pallidipes</i> *	-
		<i>Philautus vittiger</i> *	+
		<i>Polypedates leucomystax</i>	+
		<i>Rhacophorus javanus</i> *	+
		<i>Rhacophorus reinwardtii</i>	+

(*) species endemic to Java; (-) species absent; (+) species present.

In Gunung Halimun National Park, amphibians occupy two major macro habitats: primary forest and disturbed areas. Nine species are virtually restricted to primary forest, these are: Hasselt's Litter Frog, *Leptobrachium hasseltii* (restricted to leaf litter); Hour-Glass Frog, *Leptophryne borbonica*; Bleeding Frog, *L. cruentata*; Javan Torrent Frog, *Huia masonii*; Poisonous

Frog, *Rana hosii*; Pygmy Creek Frog, *Limnonectes microdiscus*; Pearly Three Frog, *Nyctixalus margaritifer*; Gold Striped Tree Frog, *Philautus aurifasciatus* and Wine-Colored Tree Frog, *P. vittiger*.

Disturbed areas, which include secondary forest, degraded forest, cultivation, human habitation, paddy

field and roadside ditches, are inhabited by a variety of species. The Hornet Frog, *Megophrys montana* is a leaf litter specialist, and occurs in primary, secondary or degraded forest. Paddy fields are a favorite habitat for several frog species. In Gunung Halimun National Park, five species are very abundant in paddy fields, such as the Javan Chorus Frog, *Microhyla achatina*; Cricket Frog, *Rana nicobariensis*; Rice Field Frog, *Fejervarya cancrivora*; Grass Frog, *F. limnocharis*; and Stone Creek Frog, *L. macrodon*.

Some species that inhabit paddy fields are found in small numbers, including the Green Paddy Frog, *R. erythraea* and the Sumatran Puddle Frog, *Occidozyga sumatrana*. In Gunung Halimun National Park especially in southern part, *F. cancrivora* and *L. macrodon* are regularly collected and sold in the market for human consumption. Because of this activity, these two species occur in low numbers in southern parts of the park. However, in these areas *F. limnocharis* is very abundant, because it occupies the niches of these two species. Two species of tree frogs occur in tea plantations. The Javan Tree Frog, *Rhacophorus javanus* and Javan Flying Frog, *R. reinwardtii*; they are both abundant in tea plantations but are usually restricted to peat swamps or permanent pools inside the plantations.

Although more than half of the amphibian species that found in Gunung Halimun National Park are numerous in disturbed habitat, including edificarian, ruderal, agroforest, disturbed native forest and secondary vegetation; but they are vulnerable ecologically. At the present time, the exploitation by human activity such as gold mining, logging, and habitat modification give significant contribution to habitat destruction. The destruction of ecological system is

widely held as the primary cause for the loss of amphibian species together with reduction their population size (Gardner 2001).

The present management of the park is essentially non interventionist with respect to forest succession. These are suitable for the maintenance of a diverse herpetofauna especially amphibian and no alterations to this strategy. However, recently Gunung Halimun National Park has a plan to increase tourist access. Evidence from experienced park guides suggests that this disturbance has depleted a previously healthy population of amphibian.

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