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Checklist of Amphibians and Reptiles at the Malaysian Palm Oil Board Research Station, Kluang, Johor

Bettycopa Amit*; Andrew Alek Tuen#; Pui Yong Ming# and Mohd Haniff Harun*

ABSTRACT

A rapid assessment survey of the amphibians and reptiles found at the Malaysian Palm Oil Board (MPOB) Research Station in Kluang, Johor, was carried out from 7-10 June 2013. Visual encounter surveys (VES) were used to identify the species of amphibians and reptiles encountered along the six sampling trails. A total of 12 amphibian species from six families and seven reptilian species from five families were discovered and identified in the research station. In terms of amphibians, the most common and widely distributed species were the cricket frog, Hylarana nicobariensis, *and the four lined tree frog,* Polypedates leucomystax, *with both species observed in all of the survey sites. Calls from high numbers of amphibian species were heard in the swampy riparian areas and along the small drains. In terms of reptiles, the clouded monitor lizard,* Varanus nebulosus, *was observed in all of the survey sites, including along the plantation's main roads. Maintaining and protecting small streams and swampy areas in the plantation is crucial to preserve amphibian and reptile species and their populations.*

ABSTRAK

Tinjauan terhadap spesies amfibia dan reptilia di Stesen Penyelidikan Minyak Sawit Malaysia (MPOB), Kluang, Johor telah dijalankan pada 7-10 Jun 2013. Survey Encounter Visual (VES) *digunakan untuk mengenalpasti spesies amfibia dan reptilia pada enam tapak persampelan. Sejumlah 12 spesies amfibia dari enam famili dan tujuh spesies reptilia dari lima famili telah dikenalpasti hadir di Stesen Penyelidikan MPOB, Kluang. Dari segi amfibia, spesies yang paling umum adalah 'criket frog'* Hylarana nicobariensis *dan 'four line tree frog'* Polypedates leucomystax, *kedua-dua spesies diperhatikan di semua tapak persempelan. Jumlah spesies amfibia yang banyak ditemui di kawasan paya dan saliran parit atau sungai yang kecil. Dari segi reptilia, biawak Varanus nebulosus diperhatikan di semua tapak persampelan termasuk di sepanjang jalan utama perladangan. Dengan mengekalkan dan melindungi kawasan sungai dan paya yang kecil di ladang sawit adalah penting untuk mengekalkan spesies dan populasi amfibia dan reptilia.*

Keywords: amphibian, reptile, oil palm plantation.

INTRODUCTION

According to the Martin and Hine (2008), amphibian is the class of vertebrate chordates that contains frogs, toads, newts and salamanders. Due to their complex life cycle and need for both wetland and terrestrial habitats, amphibians are sensitive to environmental change (Alford and Richards, 1999). Reptile is the class which includes crocodiles, lizards, snakes, tortoises and turtles (Martin and Hine, 2008). They can live in wetland and terrestrial habitats as their skin is covered by a layer of horny scales, preventing water loss.

The Malaysian Palm Oil Board (MPOB) Research Station Kluang in Johor was established in September 1979. The research station is located 13 km and 115 km from Kluang and Johor Bahru, respectively. The station is made up of two areas: the main station (486 ha) and Bukit Lawiang (404 ha). The main function of the station is for research and development on oil palm breeding, and this station has been recognised as having the largest oil palm germplasm collection in the world. MPOB Kluang Estate is an oil palm estate, located mainly on mineral soil and has undulating topography. Most of the palms are mature, although in some areas they have been recently replanted. The estate is well-maintained, except for non-planted areas along the stream and wetlands. It is surrounded by a farm owned by MARDI and by public roads; thus, it is like an island isolated from natural forest. The sole objective of this study was to take an inventory of the herpetofauna (amphibians and

* Malaysian Palm Oil Board,
6, Persiaran Institusi, Bandar Baru Bangi,
43000 Kajang, Selangor, Malaysia.
E-mail: bettycopa@mpob.gov.my

Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak.

reptiles) in the main station of this plantation, and to determine their conservation status as described by the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (2017).

MATERIALS AND METHODS

Survey sites

The amphibian and reptile (herpetofauna) survey was conducted at the main station of MPOB Research Station in Kluang, Johor, from 7-10 June 2013. In total, six unique sites were surveyed in the estate area which feature palms of different planting years, namely Site 1 and 2 (in 2000), Site 3 and 4 (2002), Site 5 (2003) and Site 6 (1997/1996) (*Figure 1*). Habitat conditions found at the survey sites are shown in *Figure 2*.

Amphibian and Reptile Survey

Visual encounter surveys (VES) were carried out to identify the species of amphibians and reptiles in the oil palm plantation. VES, defined by Crump and Scott (1994) as a detection technique, was used in all the sites. Night surveys with the aid of torchlights (from 19:30 to 22:30) and observations along the plantation's main roads were included to verify overall abundance in the plantation area. All amphibian and reptile species sighted were recorded and photographed with a digital camera (Nikon D90 with 105 mm macro lens) for reference. Collected specimens were identified directly in the field and then released. Herpetofauna species identification was based on Frost (2013), Das (2010, 2013) and Berry (1975).

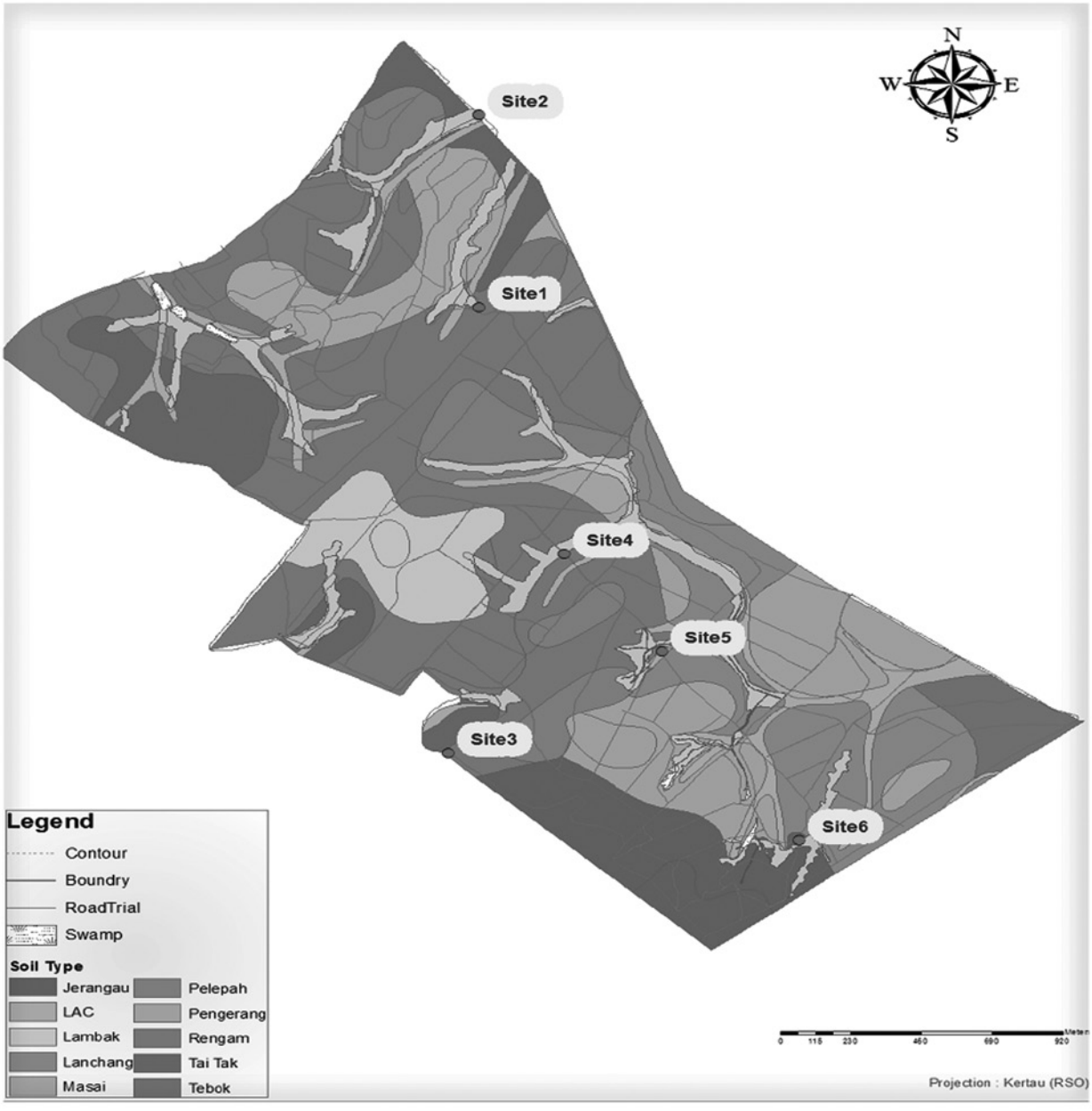

Figure 1. Location of six sampling sites within MPOB Research Station Kluang, Johor.

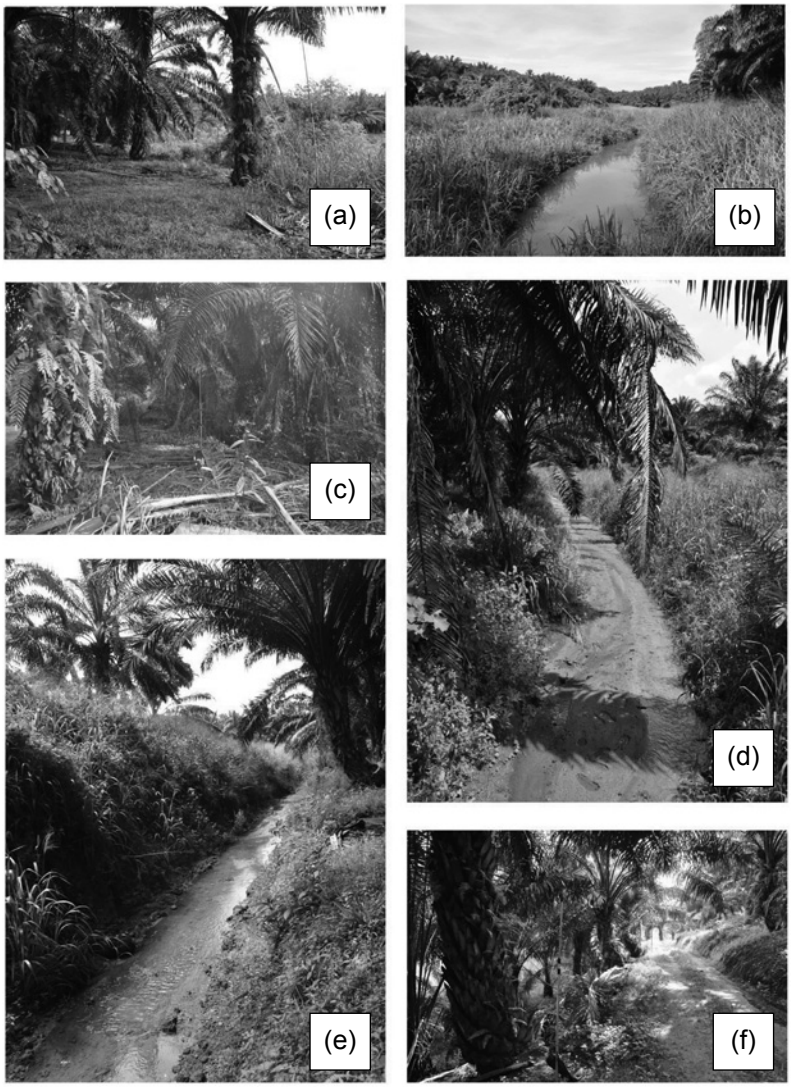

Figure 2. Habitats found at the survey sites: (a) area with grasses at survey site 1, (b) swampy riparian area at survey site 2, (c) frond pile/heap at survey site 3, (d) and (e) drainage system at survey sites 4 and 5, respectively, and (f) plantation road at survey site 6.

RESULTS AND DISCUSSION

The results of the survey show that nineteen species of herpetofauna, *i.e.* 12 frogs, two snakes and five lizards were recorded at the survey sites (Table 1). They are distributed into 10 families and 14 genera (number of species per family in parenthesis): Bufonidae (1), Ranidae (4), Dicroglossidae (3), Rhacophoridae (2), Microhylidae (2), Colubridae (1), Elapidae (1), Gekkonidae (3), Agamidae (1) and Varanidae (1). All the species are listed as "Least Concern" in the IUCN Red List, except four reptile species (*Ptyas korros, Gekko monarchus, Hemidactylus platyurus* and *Calotes versicolor*) which have not yet been assessed for the IUCN Red List (IUCN, 2017). For the amphibians (*Figures 3* and *4*), the most common and widely distributed species were the cricket frog, *Hylarana nicobariensis*, and the four lined tree frog, *Polypedates leucomystax*, with both species observed in all of the survey sites. Another three species, the rough sided frog (*Hylarana glandulosa*), the grass frog (*Fejervarya limnocharis*) and the dark sided chorus frog (*Microhyla heymonsi*), were observed in five survey sites. *H. glandulosa* and *M. heymonsi* were found to be highly abundant in the riparian areas of the plantation (survey sites 2, 4 and 5), evidenced by numerous large calling groups of both species heard in the swampy riparian areas and along the drains (*Figure 2*: B, D and E). Most individuals of *Duttaphrynus melanosticus, F. limnocharis* and *Hoplobatrachus rugulosus* were encountered along the plantation roads and near forest patches. Four commensal species, which are *D. melanostictus, F. limnocharis, M. Heymonsi and P. Leucomystax*, were recorded in the plantation. Commensal species normally live in severely disturbed environments, or environments directly associated with the activities of man (Inger, 2005).

For the reptiles (*Figure 4*), the clouded monitor lizard, *Varanus nebulosus*, was observed in all of the survey sites, including along the plantation's main roads. This species was also seen basking on the warmer side of an oil palm trunk as it is an excellent tree climber. The house geckos (*Gekko manarchus*, *Hemidactylus platyurus* and *H. frenatus*) were observed abundantly on the walls of

TABLE 1. SPECIES LIST AND DISTRIBUTION OF AMPHIBIANS AND REPTILES DETECTED AT THE *MALAYSIAN PALM OIL BOARD* RESEARCH STATION IN KLUANG JOHOR AND THEIR CONSERVATION STATUS UNDER THE IUCN RED LIST OF THREATENED SPECIES 2017

		Site (S)						IUCN Red List
Scientific name	**Common name**	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**Global Status**
Amphibian								
Bufonidae								
Duttaphrynus melanostictus	Black-spectacled toad		√	√		√	√	LC*
Ranidae								
Hylarana labialis	White-lipped frog		√	√			√	LC
Hylarana nicobariensis	Cricket frog	√	√	√	√	√	√	LC
Pulchrana glandulosa	Rough sided frog		√	√	√	√	√	LC
Dendrobatidae								
Ameerega trivittata	Three-striped frog						√	LC
Dicroglossidae								
Fejervarya limnocharis	Asian grass frog		√	√	√	√	√	LC
Fejervarya cancrivora	Crab-eating frog			√	√			LC
Hoplobatrachus rugulosus	East Asian bullfrog					√	√	LC
Rhacophoridae								
Polypedates leucomystax	Four-lined tree frog	√	√	√	√	√	√	LC
Polypedates macrotis	Dark-eared tree frog		√		√			LC
Microhylidae								
Kaloula pulchra	Malaysian narrowmouth toad		√					LC
Microhyla heymonsi	Dark sided chorus frog		√	√	√	√	√	LC
Reptiles								
Colubridae								
Ptyas korros	Indo-Chinese rat snake				√			-
Elapidae								
Naja sumatrana	Equitorial spitting cobra	√						LC
Gekkonidae								
Gekko monarchus	Spotted house gecko				√		√	-
Hemidactylus platyurus	Flat-tailed house gecko		√	√	√			-
Hemidactylus frenatus	Common house gecko		√					LC
Agamidae								
Calotes versicolor	Oriental garden lizard			√			√	-
Varanidae								
Varanus nebulosus	Clouded monitor	√	√	√	√	√	√	LC

Note: *Least concern.

settlement buildings, while some individuals were observed on the oil palms. Two species of snakes were recorded in this survey, the Indo-Chinese rat snake (*Ptyas korros*) and equatorial spitting cobra (*Naja sumatrana*). The main prey of these snakes are rodents, and they may be considered as natural predators for controlling the rat population in oil palm plantations (Miller, 2015).

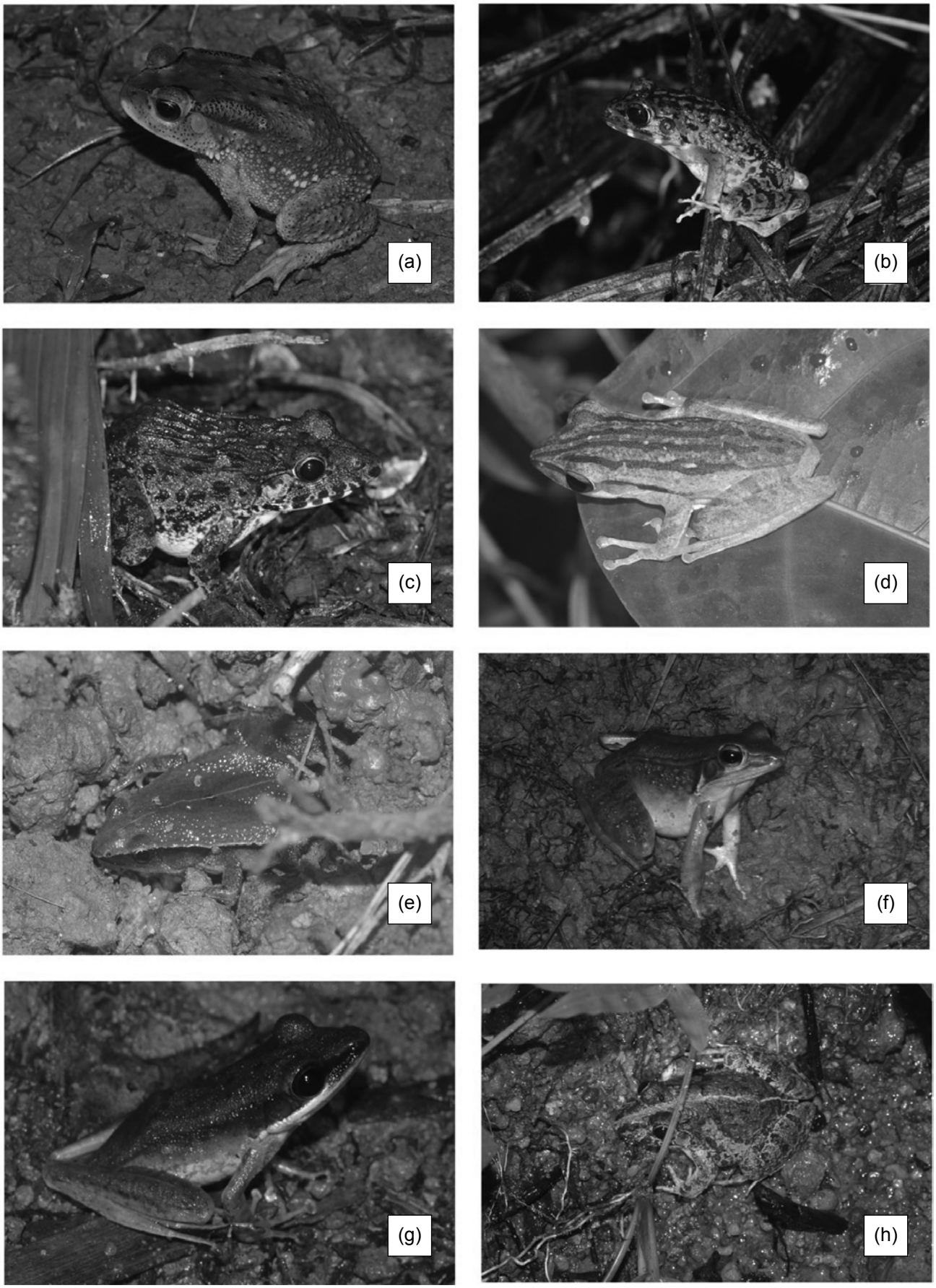

Figure 3. Anuran species collected at the MPOB Research Station in Kluang, Johor: *(a)* Duttaphrynus melanostictus, *(b)* Hylarana glandulosa, *(c)* Hoplobatrachus rugulosus, *(d)* Polypedates leucomystax, *(e)* Microhyla heymonsi, *(f)* Humerana miopus, *(g)* Hylarana labialis *and (h)* Fejervarya limnocharis.

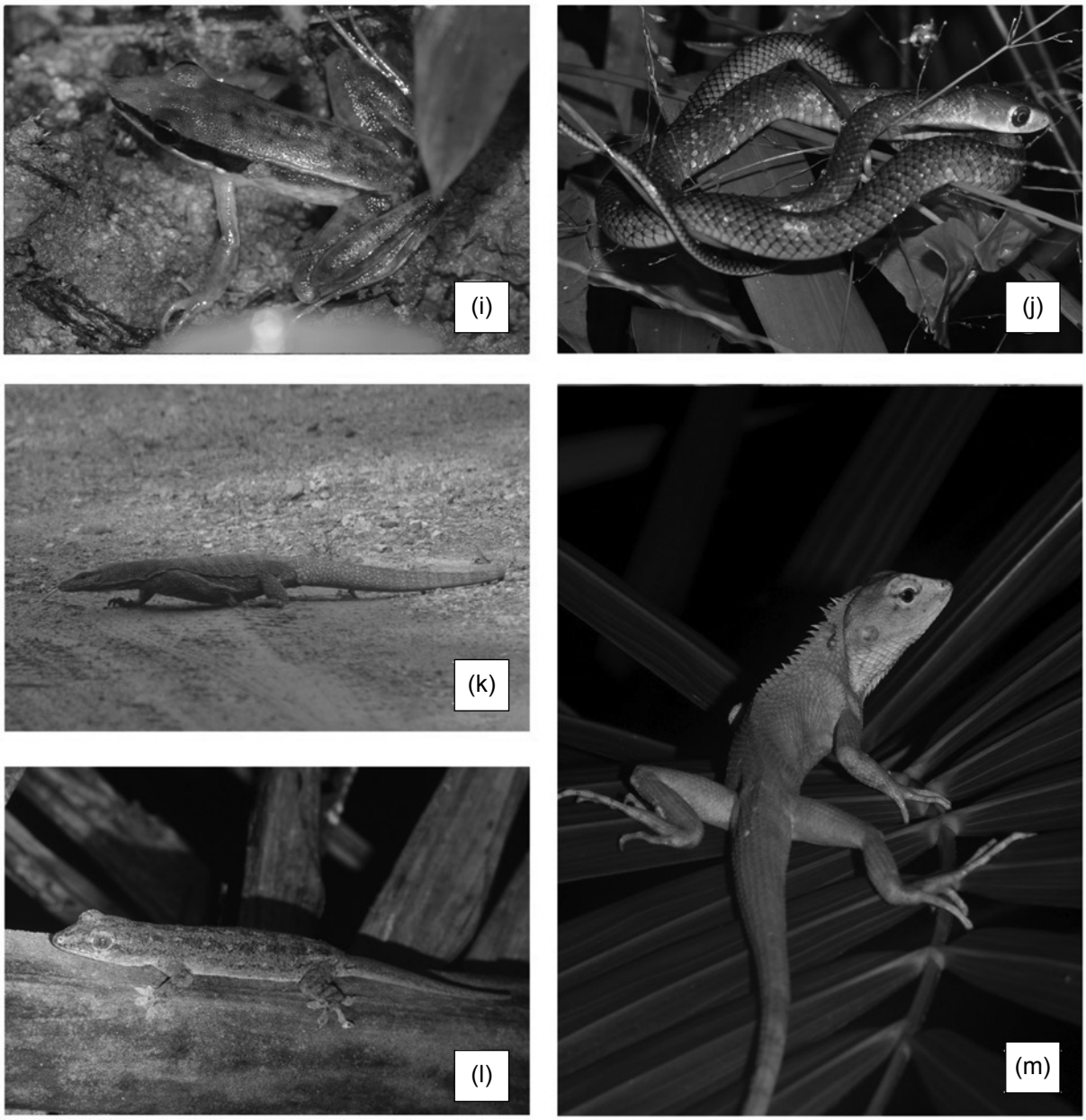

Figure 4. Frog and reptile species collected at the Research Station in Kluang, Johor: (i) Hylarana nicobariensis*, (j)* Ptyas korros*, (k)* Varanus nebulosus*, (l)* Hemidactylus frenatus *and (m)* Calotes versicolor.

Data in checklists are important in conservation planning as they make the authorities aware of the diversity and variety of fauna present in a certain area. This will then help in achieving better conservation and management of an ecosystem. Preserving certain habitats in the plantation, such as a river, small stream and swampy area where the amphibians and reptiles can live undisturbed, is crucial for providing breeding sites.

CONCLUSION

The amphibian and reptile survey carried out in MPOB Research Station, Kluang, showed that swampy riparian areas present in the plantation estate support more species of herpetofauna. Availability of those habitats in the plantation of the research station helps to support higher species diversity and abundance, especially those species that are commensal with human disturbance. Therefore, maintaining those habitats in the plantation is crucial to preserve the currently present herpetofauna species and their populations.

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