Introduction
North-East India, which comprises of Meghalaya and seven other hilly States, falls under the confluence of two biodiversity hotspots of the world, viz the Himalaya and the Indo-Burma (http://www.bsienvis.nic.in/). The north-eastern biodiversity, therefore, shows a marked difference from the mainland Indian biodiversity, as it has more affinity with South East Asia, geographically as well as biologically. One such instance can be found in the distribution range of the Genus Megophrys, which is predominantly a South East Asian frog genus, extending only into the north-eastern region of India (Frost, 2018).

In recent times, several research works on the amphibian fauna of Meghalaya relating to new discoveries (Mahony et al., 2011 and 2013) or range extensions (Saikia and Sen, 2012; Sangma and Saikia, 2015) of Megophrys have been published. With these published accounts the number of species under the genus Megophrys from Meghalaya have gone up from two to eight. While M. boettgeri was removed from the faunal list of India in 2013, a recent report on its occurrence in Meghalaya needs to be verified. Considerable doubts have been raised regarding the range extension of M. wuliangshanensis into India in recent years. Discussions on the distributional records of this species from India are provided and re-examination of a few specimens identified as M. wuliangshanensis by previous workers have also been done. A common name for M. oropedion is also proposed.

Abstract
The recent descriptions and range extensions of many species of genus Megophrys have raised the number of species in Meghalaya from two to eight. While M. boettgeri was removed from the faunal list of India in 2013, a recent report on its occurrence in Meghalaya needs to be verified. Considerable doubts have been raised regarding the range extension of M. wuliangshanensis into India in recent years. Discussions on the distributional records of this species from India are provided and re-examination of a few specimens identified as M. wuliangshanensis by previous workers have also been done. A common name for M. oropedion is also proposed.

Keywords: Amphibia, Distributional, Megophrys boettgeri, Shyllong horned toad
Ilona Jacinta Kharkongor, Bhaskar Saikia and Rita Deb

Systematic List
Class AMPHIBIA
Order ANURA
Family MEGOPHRYIDAE

1. *Megophrys boettgeri* (Boulenger, 1899)
Boettger's Pelobatid Toad

1899. *Leptobrachium boettgeri* Boulenger, Proc. Zool. Soc. London: 171 (Type locality: “Kuatun, a village about 2700 miles from Foochow, in the mountains at the North-west of the Province of Fokien (=Fujian), at an altitude of 3000 to 4000 feet or more”, China.)

*Material examined:* Nil.


*Remarks:* Mahony et al. (2013) has raised doubts about the existence of this species in India, and commented that the previous reports could be a result of wrong identifications. However, Sangma and Saikia (2015) have reported (along with two photographs and a brief description) this species from Tura Peak Reserve Forest, West Garo Hills district of Meghalaya as a new record from the State. We are of the opinion that further detailed study on the ‘identified’ specimens will help to resolve the ambiguity in the range extension of this species into India. However, for the time being, we are including this species in the amphibian checklist of Meghalaya.

2. *Megophrys glandulosa* (Fei, Ye and Huang, 1991)
Glandular Horned Toad (Figure 8, Plate-IV)

1990. *Megophrys glandulosa* Fei, Ye & Huang. Key to Chinese Amphibians. Chingquing, China, 99: 273 (Type locality: Wuliang Shan, Jingdong, Yunnan Province, China)


*Remarks:* Recently reported from Meghalaya (Sangma and Saikia, 2015).

3. *Megophrys major* (Boulenger, 1908)
Major’s Horned Toad (Figure 1 and 2, Plate-I)


*Remarks:* Recently reported from Meghalaya (Sangma and Saikia, 2015).

4. *Megophrys megacephala* Mahony, Sengupta, Kamei and Biju, 2011
Big-headed Horned Frog

2011. *Megophrys megacephala* Mahony, Sengupta, Kamei and Biju, Zootaxa, 3059: 37 (Type locality: "Basistha Road, approx. 5 km south of Basistha temple, East Khasi Hills, northern Meghalaya, India")

*Material examined:* Nil.

*Distribution:* INDIA: Meghalaya and Assam. Elsewhere: Not reported

*Remarks:* Recently described from Meghalaya. The Type locality is apparently in Ri Bhoi District in the northern part of Meghalaya, along its border with Assam, and not East Khasi Hills.

5. *Megophrys oropedion* Mahony, Teeling and Bjiu, 2013
Shyllong Horned Toad (Figure 3 and 4, Plate-II)


*Distribution:* INDIA: Meghalaya. Elsewhere: Not reported
**Remarks:** Recently described from Meghalaya. Proposed common name “Shillong Horned Toad” is based on the location of the Type locality in the foothills of Lum Shyllong (=Shillong Peak).

6. **Megophrys parva** (Boulenger, 1893)  
**Concave Crowned Horned Toad** (Figure 5, Plate-III)


**Remarks:** Apparently the most common Horned Toad in Meghalaya, and the most widely distributed *Megophrys* in India.

7. **Megophrys robusta** (Boulenger, 1908)  
**White-lipped Horned Toad** (Figure 6, Plate-III)


**Material examined:** 1 ex. (Regd. no. V/A/NERC/1051), War Umsning, East Khasi Hills, Meghalaya, 19.8.2006, Coll. S. Swell.

**Distribution:** INDIA: Assam, Nagaland, Meghalaya, Arunachal Pradesh and West Bengal. Elsewhere: China; Myanmar; Vietnam; Hong Kong; Bangladesh; Nepal.

**Remarks:** Rarely found. It is, by far, the largest Horned Toad in size.

8. **Megophrys zunhebotoensis** (Mathew and Sen, 2007)  
**Zunheboto Horned Toad** (Figure 7, Plate-IV)


**Material examined:** 1 ex. (Regd. no. V/A/NERC/1009), Mawbah area, near Cherrapunjee, East Khasi Hills, Meghalaya, 25.10.2010, Coll. A. Rana and party.

**Distribution:** INDIA: Nagaland and Meghalaya. Elsewhere: Not known.

**Remarks:** Reported from Meghalaya (Saikia and Sen, 2012).

**Abbreviation**

V/A/ERS: Vertebrate/Amphibian/Eastern Regional Station  
V/A/NERC: Vertebrate/Amphibia/North Eastern Regional Centre

**Discussion**

There has been several recent works on the genus *Megophrys* by various researchers in India. This has resulted in many new records and discoveries, as well as debates regarding the availability of *M. boettgeri* (Boulenger, 1899) in India, and hence, questioning the correctness of the identification
of earlier specimens of *Megophrys* as *M. boettgeri* by previous workers. In the light of these developments, the authors have undertaken the present study in an attempt to throw some light on the systematic list of this genus in Meghalaya, in particular, and in India, in general. During the course of the study, we have collected a few *Megophrys* from Shillong, re-examined the already identified collections of *Megophrys* from Meghalaya deposited in the National Zoological Collections of NERC, ZSI, Shillong and studied the literature of earlier workers. This study has resulted in the listing of six more species to the earlier two recorded species (Mathew and Sen, 2010) raising the total number to eight species in the list of genus *Megophrys* from Meghalaya. From our recent collection, we have found one specimen of recently described species of *M. oropedion* Mahony, Teeling and Biju, 2013. This specimen was collected from Umlyngka, Upper Shillong- in between Mawphlang and Malki (the type locality of the species).

Mahony et al. (2013) has raised doubts about the “correctness of the identification” of *M. boettgeri* by previous workers and has removed it from the checklist of Indian amphibians. However, recently, Sangma and Saikia (2015) has reported this species from Tura Peak Reserve Forest, in West Garo Hills, Meghalaya, giving two photographs and a brief description. A perusal of the photographs provided may look like a misidentified *M. vegrandis*, however, in their description of the species they have reported a SVL of 8 cm (80 mm), while *M. vegrandis* has a SVL range of 27.5–30.6 mm. We are of the opinion that further detailed study on the specimens collected by Sangma and Saikia (2015) from Tura Peak will help to clarify the position and the distribution of *M. boettgeri* in India.

Interestingly, from the identified collection of ZSI, Shillong, the authors have also come across four *Megophrys* specimens, collected from Meghalaya and Mizoram which were identified by previous workers as *M. wuliangshanensis* Ye and Fei, 1995. Since the species has not yet been reported from Meghalaya and Mizoram, the four specimens in our hand would have formed the first record of the species from these two North-East India States [i.e. Meghalaya and Mizoram]. Earlier, Ao et al., (2003) had reported *M. wuliangshanensis* from Nagaland, which is also the first report of the species from India. Since then the species has been reported from Manipur (Ningombam and Bordoloi, 2007) and Assam (Sengupta et al., 2010), in North-East India.

The ‘*M. wuliangshanensis*’ specimens in our hands warranted a thorough study and the outcome is that these four specimens were not agreeing with the diagnostic characters of *M. wuliangshanensis* provided by Ao et al., (2003), nor with the specimen [V/A/ERS/564] of ‘*M. wuliangshanensis*’ deposited by Dr. Meren Ao [one of the authors of Ao et al., (2003)] in the ZSI, Shillong; and neither with the diagnostic characters and the photographs provided by Fei and Ye (2016). In fact, they show more affinity towards *M. serchhipii* (Mathew and Sen, 2007). Compounding the problem is the fact that earlier reports of *M. wuliangshanensis* from India do not contain diagnosis or photographs of the specimens on which their report is based! While Ao et al., (2003) provided brief morphological characters; Ningombam and Bordoloi (2007) provided only a few morphometric measurements, whereas Sengupta et al., (2010) merely reported the range extension of this species into Assam. To add to the confusion, the photographs and diagnostic characters of *M. wuliangshanensis* as given in Mathew and Sen (2010), contradicts the morphological characters as per Ao et al., (2003) and Fei and Ye (2016). Considering the fact that there has been no report of this species from the intervening regions between the type locality in Yunnan (China) and North-East India (Frost, 2018) coupled with the scant but vague and/or contradicting information provided by the authors reporting *M. wuliangshanensis* from India, a re-examination of the specimens on which the reports are based is required. Even, Fei and Ye (2016) have raised their doubt regarding the range extension of this species into India.

Mahony et al (2013) when describing *M. oropedion* from Shillong, separated it from its closest relative *M. parva* by the larger size of the female as in the latter species the females are smaller in size. In a very recent paper describing two small sized *Megophrys* (*M. sanu* and *M. katabhako*) from Darjeeling and Sikkim, Deuti et al., (2017) restricted the small sized *M. parva* to Meghalaya based on the presumption made by Sengupta et al (2009), that the River Brahmaputra may be a ‘geographical barrier’ in the distribution of amphibia (*Kaloula* spp.) in the region. However, to extrapolate this presumption and apply it to the distribution and/or in restricting the distribution of other amphibian species needs more studies, as recent publications have reported the occurrence in the northern bank of River Brahmaputra, of a few species like *Leptobrachium smithi* and *Rhacophorus*.
suffry, hitherto known only from the southern bank of River Brahmaputra (Dutta et al., 2013; Bordoloi et al., 2008; Saikia et al., 2017).

Moreover, though we have included M. boettgeri in this paper on the basis of the report by Sangma and Saikia (2015), a re-examination of the specimens collected by them is necessary as this species has been removed from the faunal list of India by Mahony et al., (2013). Also, in the light of doubt raised by Fei and Ye (2016) and Frost (2018) regarding the range extension of M. wuliangshanensis into India, and taking into consideration our findings during the course of this work, re-examination of all the previous reports of this species from India is needed.

A common English name is proposed for M. oropedion: ‘Shyllong Horned Toad’ since when describing the species having its type locality in Shillong, Mahony et al., (2013) did not propose one. Shillong is the anglicized name for ‘Shyllong’, so named after a local deity, U’Lei Shyllong; hence the common name proposed.

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References


Figure 1. Dorsal view of *Megophrys major*

Figure 2. Femoral glands of *Megophrys major*
PLATE 2

Figure 3. Dorsal view of *Megophrys oropedion*

Figure 4. Ventral view of *Megophrys oropedion*
PLATE 3

Figure 5. Dorsal view of *Megophrys parva*

Figure 6. Dorsal view of *Megophrys robusta*
PLATE 4

Figure 7. Dorsal view of *Megophrys zunheboensis*

Figure 8. Dorsal view of *Megophrys glandulosa*