

Addition of *Ptyas nigromarginata* (Blyth, 1854) (Squamata: Colubridae) to the Snake Fauna of Thailand with Preliminary Remarks on Its Distribution

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Abstract The first record of *Ptyas nigromarginata* (Blyth, 1854) from Thailand and a new record from China are reported. Literature and internet sources were searched for previous records of this species to establish its geographic and altitudinal distributions in Asia. The distribution in India was adapted to the new state division of the northern part of the country. The results show that the species almost exclusively occurs in hill evergreen and montane forests of the Himalayan foothills and mountain ranges continuous with it, at altitudes of 1000–2300 m above sea level.

Keywords *Ptyas nigromarginata*, Nan Province, Lijiang, Himalaya, distribution pattern

1. Introduction

There has been a long dispute about the snake genera *Ptyas* Fitzinger, 1843 and *Zaocys* Cope, 1861 (David and Vogel, 1996). At the moment we regard the genus *Zaocys*, with some reservation, as a synonym of *Ptyas* (Taylor, 1965). The gender of the generic name *Ptyas* is feminine, whereas *Zaocys* is masculine, as pointed out by David and Das (2004), so the correct nomen for the species discussed is *Ptyas nigromarginata* (Blyth, 1854).

The genus *Ptyas* is a not-so-speciose snake genus, containing a total of 8 species. Most of them are currently regarded as widespread. There has never been a review of this genus and cryptic species might be expected. Species in this genus are medium to large snakes, often living in disturbed areas in close vicinity of men. They are fast, day active snakes and good climbers. All species are oviparous. Due to their size some species are exploited for the leather trade (Wang and Xie, 2009) or for consumption (Taylor, 1965; Teynié *et al.*, 2004). Dwindling populations in Thailand and the awareness that they are useful predators of rodents have resulted in the

regulation of the export of live specimens or parts of them (Cox, 1991).

The species under study, *P. nigromarginata* (Blyth, 1855), was originally described as *Coluber nigromarginatus* based on the holotype ZSI 7343 (Zoological Survey of India) collected from the vicinity of Darjeeling, northeastern India. Little information has been published about *P. nigromarginata* (Whitaker and Captain, 2004). In contrast to other species in this genus, it seems to be confined to hill evergreen and montane forests. Live adults of *P. nigromarginata* are easily recognizable. They are large snakes with a characteristic colour pattern: the head is brownish, the anterior half of the body emerald or velvet green, while the posterior part of the body and tail are striped black and whitish. Yet, as we became aware during this study, it has been confused with other species, in particular *P. dhumnades* (Cantor, 1842). On the other hand, juveniles are strikingly similar to the juveniles of the species *P. dhumnades* — both black and whitish striped over most of their body — which obviously has resulted in erroneous identifications.

There are only anecdotal, outdated or even erroneous records of both the geographical and altitudinal distribution of this species in the literature (Sharma, 2003; Zhao, 2003; Das, 2010). So far, it is known from India, Nepal, Bangladesh, Myanmar, Bhutan, Vietnam and China. The exact distribution is discussed below.

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2. Material and Methods

To create a map on the distribution of *P. nigromarginata*, all possible literature sources were searched for records. In addition, two specimens were found by the authors in China and Thailand. Circumstances of the findings are described. An internet research was conducted to track unpublished records, and authors of recent records were interviewed. Some twenty museum specimens (mentioned in the text with their registration number) were examined and photographed, and a number of specimens of *P. dhumnades* were inspected for comparison. The records are listed below, but mere listings such as checklists without new information are mostly omitted. Localities are put on a locality dot-map in black dots, whereas white dots are used for the localities considered doubtful and for which records need to be confirmed.

Museum abbreviations: BMNH: Natural History Museum, London, UK; CAS: California Academy of Sciences, San Francisco, USA; MNHN: Muséum National d'Histoire Naturelle, Paris, France; SMF: Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt-am-Main, Germany; USNM: United States National Museum, Washington, D. C., USA.

3. Results

3.1 Distribution according to countries

3.1.1 Afghanistan BMNH 43.6.21.69 is without doubt *P. nigromarginata*, and if the collecting date (1843) is correct, this is the oldest specimen in a museum collection we are aware of. There is no information how the British Museum of Natural History acquired the specimen, whereas the locality from where it is supposed to originate is noted as “- ? [Afghanistan]”. Afghanistan is at least 1500 km to the northwest of Central Nepal, and if the locality were valid, it would extend the range that far to the west. What's more, it would become the most northern locality known. However, we have serious doubts about the origin of this specimen and therefore exclude Afghanistan from the species' distribution.

3.1.2 Nepal In Nepal the distribution is unclear. Günther (1858) is often cited as mentioning Central Nepal (Shah, 1995; Shah and Tiwari, 2004). In fact Swan and Leviton (1962) guessed that the specimens mentioned by Günther as being collected by B. H. Hodgson (BMNH 58.6.24.10, 58.6.24.6) were from the vicinity of Kathmandu, but left the possibility open that they were brought to Hodgson by collectors from some other localities. Günther (1858) listed under the synonym *Coryphodon carinatus*

Günther, 1858 (synonymy fide Günther, 1864; missing in Boulenger, 1890; Smith, 1943) for this species the localities Khasya (Khasi Hills) and Sikkim, which are in India. Other localities that Günther mentioned are Borneo and Chusan, but refer to different species, while the locality Afghanistan is probably erroneous (see above). Günther (1860, 1864) and Boulenger (1893) also mentioned the two specimens collected by Hodgson without information about their precise locality. No records were reported in a herpetological survey of the Anapurna-Dhaulagiri Region (Central Nepal) about 200 km west of Kathmandu (Nanhoe and Ouboter, 1987). Gruber (2002) concluded that the occurrence of this species in Nepal is still based on Günther (1858) and Smith (1943), without precise locality; no other specimen has been recorded from this country. We doubt 'near Kathmandu' as a valid locality as the valley of Kathmandu is herpetologically well explored. What's more, Günther most probably got this specimen from Hodgson who used to collect in eastern Nepal (David, personal communication). Whatever may be the exact localities in Nepal, the country most probably forms the western limit of the distribution of the species.

3.1.3 Bhutan In Bhutan *P. nigromarginata* is known from 87 km north of Phuntsholing at an elevation of 1700 m (Bauer and Günther, 1992). Four specimens were recorded during the period of November 2007 and September 2008 in the Bumdeling Wildlife Sanctuary, two of them in Trashiyangtse District (one at an elevation of 1885 m), and two in Mongar District. The Trashiyangtse specimens were reported to be active at 11:30 h, one slithering over *Cyathea* fern (Wangyal, 2011).

As Bhutan is hardly known herpetologically, it cannot be judged if it is a rare species in this country.

3.1.4 India Usually the distribution in India is given as: Darjiling (the modern spelling for the city long known as Darjeeling, State of West Bengal), Sikkim and Assam or just Eastern Himalayas and Assam (Deoras, 1965; Mahendra, 1984; Murphy, 1986; Molur and Walker, 1998; Whitaker and Captain, 2004; Sharma, 2007). In fact it has been recorded in the following Indian states:

West Bengal: The holotype originated from Darjeeling (Blyth, 1855), whereas a single specimen from the Darjeeling Museum examined by Wall had no locality attached. The latter was probably, like nearly all snakes in the collection, obtained from nearby hill slopes ranging between about 656–1475 m (Wall, 1909b). A specimen collected by J. Gammie in 1872 in Darjeeling was reported by Ahmed and Dasgupta (1992).

Specimens BMNH 91.9.11.21 collected by T. Blanford

in 1891 and SMF 18086 (a specimen SMF had obtained from the British Museum in 1891) are also originating from Darjeeling and were examined. BMNH 1930.5.8.429 is a skull of a specimen from Darjeeling presented to the museum by Frank Wall (not verified). Most modern authors did not mention that Darjeeling (now Darjiling) is part of West Bengal nowadays.

In October 2011, a specimen was photographed by Shri Mrinal Bhattacharya in Lava, Darjiling District, which is at an elevation of about 2100 m (personal communication and picture). The snake was spotted on a sunny morning, basking on a fallen log. When it was approached to less than two metres it slithered away into the dense vegetation.

Meghalaya: The species is known from the Khasi Hills. A specimen (BMNH 56.13.41) was found there by Dr. Hooker (Günther, 1860) and was later also reported by Smith (1943). The skulls of two specimens, from Shillong and Cherrapunji (BMNH 1930.5.8.430–431) were donations by Col. Frank Wall. Both places are situated within the Khasi Hills.

Sikkim: Specimens obtained from Dr. Hooker and Messrs. v. Schlagentweit in Sikkim (BMNH 52.8.12.51, 60.3.19.1341) were mentioned in Günther (1860). The species was recently recorded in Sikkim's Teesta Valley at elevation of 1400–1700 m (Chettri *et al.*, 2010). All sightings were in temperate forest with cardamom plantations where the snakes were seen basking in the morning sunlight. Many dead specimens were sighted, killed by local people (Chettri, personal communication).

Arunachal Pradesh: It occurs in the Eaglenest Wildlife Sanctuary in the western part of the state (Athreya, 2005; Agarwal *et al.*, 2010). Three specimens were recorded by Agarwal *et al.* (2010) at Sessni in the park at an elevation of 1250 m, and two others at Khellong at 1900–1950 m. The latter were caught at 08:15 h during a short period of sunshine. The largest specimen had a total length of 277 cm. From the Talle Valley Wildlife Sanctuary near the town of Ziro (27°32' N, 93°52' E) three specimens were reported, two of them near the Pange Camp at 1700 m (Kadur, 2010). One (female) specimen was found foraging alongside a forest path, and the second (male) was found basking 1.4 m above the ground on a thorn and fern thicket near a stream. Both specimens were encountered on days with intermittent sun and rain during the rainy season (website Expedition Talle Valley, <http://felis.in/rave/species/reptiles/ptyas-nigromarginatus/>, last assessed August 2012). Sanyal and Gayen (2006) reported a record of a specimen collected in 1975 by J. M. Julka in Lower Subansiri District, which is east of Ziro,

near Talle Valley.

There is photographic evidence that *P. nigromarginata* also occurs in Changlang District in the eastern part of the state that borders northern Myanmar (Whitaker and Captain, 2004). This district is dominated by mountains rising to 1400–2300 m.

Nagaland: Wall (1908, 1909a) recorded it from the Naga Hills, but no localities were specified. It was recently reported from around the villages of Khonoma (25°39' N, 94°2' E) and Dzuleke (25°37' N, 93°57' E), both in Kohima District, at elevation of 1400–2000 m (Dasgupta and Raha, 2006; Das, 2008; Das and Ahmed, 2007; Grewal *et al.*, n.d.). A record of a specimen collected in 1872 by John Butler in Semaguting (now Chumukedima), in Dimapur District, was reported in Dasgupta and Raha (2006). A specimen from Dzuleke, apparently a roadkill, had a length of 240 cm (Grewal *et al.*, n.d.). It is also known to occur in Phek District, east of Kohima (Ahmed, personal communication) and a picture of a specimen from that locality was published by Ahmed *et al.* (2009).

On 18 August 2009 a one-minute videotrack titled “Nagaland Snake” was uploaded to YouTube, showing a specimen of *P. nigromarginata*, probably hit by a car, dying on a road.

It has not been found in the states of Mizoram (Harit and Ramanujam, 2002), Tripura or Manipur thus far, but can be expected there.

It is also not known from Uttarakhand (Vasudevan and Sondhi, 2010), and it is not expected to live there (Vasudevan, personal communication).

In fact all records from “Assam” were from localities that presently belong to Nagaland, Arunachal Pradesh or Meghalaya. The species has not been recorded during a recent survey of the Barail Hill Range in Assam (Das *et al.*, 2009) where it is expected to occur.

Although the species seems to be not uncommon in a number of localities, in particular southern Nagaland and western Arunachal Pradesh, the overall picture is of a rather rare snake in most of Northeast India. Evidence for this is that *P. nigromarginata* is not listed among the snake species in a survey for a conservation assessment study of the region, and apparently was excluded because of being ‘rare and/or difficult to detect’ (Pawar *et al.*, 2007).

3.1.5 Bangladesh In Bangladesh it is only known from the Chittagong Hill Tracts (color photo of adult specimen in Kabir *et al.*, 2009). This seems to be the only area suitable for this species in Bangladesh, which is mainly a country of low elevation. These hill tracts extend up to an elevation of no more than 1000 m and this is

probably close to the lower limit of the altitudinal range of *P. nigromarginata*. No exact localities are given. The species can surely be regarded as very rare and especially localized in Bangladesh.

3.1.6 Myanmar In Myanmar the first recorded specimen (BNMH 1925.4.2.31) was a 34.8 cm long juvenile obtained by Wall in 1924 at Huton in the Kachin Hills (Wall, 1925). The locality is now known as Hutung, which is about 30 km northeast of Bhamo in the southernmost corner of present day Kachin State near the Chinese border (about 24°15' N, 97°32' E). It is at an elevation of about 1715 m and surrounded by mountains; the highest peak, Nashu Bum, rises as high as 2147 m. In his paper Wall associated the locality with a height of 1370 m. In the same paper, species confined to cool mountain elevations, such as *Amphiesma bitaeniatum* (Wall, 1925; David *et al.*, 2005), were reported from 'Huton'. Also from Kachin State (Putao District: Hkakabo Razi National Park, between Da Zung Dam Village and Tasudu Village, 28°03' N, 97°36' E) is a voucher specimen (CAS 224386). This 492 mm long juvenile male was collected by the team of H. Win on 19 March 2002. It was spotted under a bush around 11:00 h at air temperature of 25 °C at an elevation of 1354 m.

Smith (1943) recorded the species from Pangnamdim in the Nam Tamai Valley, a village about 24 km northeast of Watamkawng (or Kawang), at about 27°43' N, 97°52' E, which is in the north of Kachin State, and from the Naga Hills in present day Sagaing State. BMNH 1940.6.4.68–71 is a subadult specimen collected by R. Kaulback in 1940 originating from "Paugwemdin, Triangle, Upper Burma". We guess that Paugwemdin is the same locality as Pangnamdin mentioned above.

Wall (1925) had collected snakes in various areas of Myanmar's mountainous Shan State, including Kutkai in the Northern Shan Hill, but did not report records of *P. nigromarginata* from there. Yet this state is a likely place to harbor this species, as it is adjacent to parts of Yunnan Province, China, from where several records are known.

Though Myanmar is herpetologically underexplored, the species seems to be rare or localized in the country.

3.1.7 Vietnam Nguyen (2007) and Nguyen *et al.* (2009) list the following localities for *P. nigromarginata* in Vietnam: Sa Pa in Lao Cai Province, Mu Son in Lang Son, Ba Vi in Ha Tay and Kon Plong in Kon Tum Province. With the exception of Kon Plong, these localities were taken from an earlier checklist (Nguyen, personal communication). This checklist (Nguyen *et al.*, 2005) also lists Tay Con Linh in the northeastern Ha Giang Province.

Kon Plong in Kon Tum Province (about 14°35' N, 108°04' E) is by far the most southern locality known in the whole range of the species. The place is surrounded by mountains, one rising as high as 2300 m. The subadult specimen reported to be originating from there was collected by N. Orlov and a picture of it taken by T. C. Ho is published in Nguyen *et al.* (2009). The specimen is deposited in the Zoological Institute of St. Petersburg (Nguyen, personal communication), it is unmistakably *P. nigromarginata*.

Another picture in Nguyen *et al.* (2009) with the caption "*Ptyas cf. nigromarginata*, Lao Cai" does not prove that the species under review occurs in Lao Cai Province, as the brown animal with a distinct orange-brown vertebral stripe in the photograph lacks the colour pattern of *P. nigromarginata* and seems to us to be a specimen of *P. dhumnades*.

Nguyen *et al.* (2005) themselves took the localities Lang Son and Ha Tay (and possibly also Lao Cai) from an earlier Vietnamese publication (Nguyen and Ho, 1996). This book gave four sources for their data on *P. nigromarginata*: Angel and Bourret (1933) and Bourret (1936, 1937a, b and 1939).

Bourret's papers have given rise to confusion, in considering *Zaocys nigromarginatus* a subspecies of *Zaocys dhumnades*, thus referring to it as *Z. d. nigromarginatus*. This opinion was first expressed in Angel and Bourret (1933) in which they reported a record of *Z. d. montanus* Pope, 1928 from Vietnam. The status of this subspecies is not clear. It was described only the year before by Pope based on a specimen from northwestern Fukien (now Fujian) Province in China (Pope, 1928). Angel and Bourret's Vietnamese record was from Chapa (now Sa Pa) in Lao Cai Province and concerned a very large (totally 256 cm) brown-olive snake (almost black posteriorly) with a very distinct brick red vertebral stripe, but missing dark longitudinal stripes. The description leaves no doubt that it was not a specimen of *P. nigromarginata*, but of *Z. dhumnades*.

In his major work from 1936 Bourret distinguished two subspecies of the latter species, *Z. d. dhumnades* (Cantor) known from southern China, and *Z. d. nigromarginatus* (Blyth) from the Himalayas, Burma, Yunnan and the mountains in southern China, and northern Vietnam (Bourret, 1936). In this work, the 256 cm long specimen from Sa Pa, earlier determined as *Z. d. montanus* (Angel and Bourret, 1933), was considered as belonging to *Z. d. nigromarginatus* (Blyth). A year later Bourret (1937b) reported an even larger (306 cm), very similar snake (with 'brownish red dorsal stripe')

which he had also captured in Sa Pa and identified as *Z. d. nigromarginatus* (Bourret, 1937b). In 1939 Bourret reported another record from Sa Pa, a 266 cm long specimen of *Z. d. nigromarginatus*. We have seen one of Bourret's specimens (MNHN 1933.0004). This is a large brown snake, lacking all the characters of *P. nigromarginata*. It appears from his articles that Bourret did not know the latter from Vietnam. Bourret (1939) listed all the reptiles known from Vietnam at that time, including *Z. d. nigromarginatus*, but did not mention other subspecies. The same paper contained checklists for three different hill stations in northern Vietnam—Sa Pa, Ba Vi and Mao Son. *Z. d. nigromarginatus* was listed for Sa Pa, but not for Ba Vi and Mao Son. In Nguyen and Ho (1996) no valid source is given for the latter localities and they were probably based on Bourret's data. They could not be considered to be valid localities of *P. nigromarginata* because of Bourret's misconceptions as to the identity of *P. nigromarginata*. In Bourret's articles *Z. d. nigromarginatus* is only recorded from Sa Pa. As these specimens are different from *P. nigromarginata*, as demonstrated above, Sa Pa should also be deleted from the distribution areas of this species. This omission is done in spite of the fact that Sa Pa, situated at an elevation of about 1600 m and the Fan Si Pan Mountains around as high as 3142 m, is a place where the species could be expected to occur, and records are known from adjacent, relatively nearby areas in China (Jinping Watershed National Nature Reserve and Daweishan National Nature Reserve, see below). No records are known from Tam Dao, a very intensively searched area in northern Vietnam with elevation up to 1592 m, and about 250 km to the southeast of Sa Pa (Orlov *et al.*, 2000).

So the sole valid localities in Vietnam are Kon Plong in Kon Tum Province, and Tay Con Linh in northeastern Ha Giang Province mentioned in a checklist (Nguyen *et al.*, 2005). Tay Con Linh is a 2616 m high mountain about 100 km northeast of Sa Pa (about 22°43' N, 104°50' E) range covered with montane evergreen forest. As vegetation in the areas below 1200 m has largely been cleared for agriculture, the record was probably from higher elevations of which the habitat seems to be suited to *P. nigromarginata*. However, we were unable to verify this record, and therefore consider Tay Con Linh so far as a possibly valid locality that needs confirmation.

The real distribution in Vietnam seems to be unclear but it may be concluded that the species is very rare in Vietnam and probably has a patchy distribution.

3.1.8 China

Early records: The earliest record in China might be

a specimen collected by Berezowski in Lun-ngan-fu in northern Sichuan (Günther, 1896). We could identify Lungan or Lunganfu on two early 20th century, hand-drawn maps, one from a missionary's report and another of the diary of botanist E. H. Wilson. It is situated at or near present-day Jiangyou, which is about 150 km northeast of Chengdu in Sichuan Province. Günther mentions that Berezowski has collected specimens in an area north of Chengdu. The place is surrounded by hills at the northwestern edge of the Sichuan Basin, and a number of later records were reported from similar hillsides surrounding this Basin.

Günther considered the subadult specimen from Lun-ngan-fu as *Z. dhumnades* (Cantor), but Stejneger (1925), comparing it with more recent records from China, had no doubt it was *Z. nigromarginatus* (Blyth). It is the most northern known record, thus far in the range of the species (at about 31°50' N), and we have doubts about its validity.

Subsequently, six specimens (USNM 63414, 63418, 64432, 65498, 65499, 66644) were collected by D. C. Graham in Suifu (now Yibin) and Mount Omei (Now Emei) in Sichuan Province and identified as *Z. nigromarginatus* (Stejneger, 1925). They were distinguished from *Z. dhumnades* by their colour pattern (yet this was not specified) and their larger number of subcaudals (though with some overlap). No information was given on the habitat and altitudes of the localities. Suifu is now known as Yibin and is situated at the confluence of the Min Jiang (Min River) and Jinsha Jiang (Jinsha River), at the southwestern edge of the Sichuan Basin. Downstream from Yibin the river enters the basin and is known as Chang Jiang (Yangtze River). Mount Omei (or Emei, Emei Shan) is a 3099 m high mountain 50 km west of Leshan, also at the edge of the Sichuan Basin and surrounded by hills.

A specimen in the collection of the British Museum (BMNH 1914.3.2.12), also collected by Graham, originated from Yunnan Fu (now Kunming in Yunnan Province). Eight specimens were reported by Schmidt (1927). Four of them were collected in May 1917 by R. C. Andrews and Edmund Heller in Tengyueh, Yunnan. Tengyueh is about 30 km north of present day Kunming which is at an elevation of at least 1900 m. Two specimens were collected in September 1921 by Walter Granger in Luanshikau, Wanhshien (now Wanzhou), at an altitude of 915 m. Two other specimens collected by Granger in December 1921 were also from Wanhshien, Sichuan. Wanhshien is in Chongqing Municipality. We suppose Luanshikau is another spelling for Yengchingkou, an uphill site with early Pleistocene fossil deposits where

Granger did excavations. Pope (1934) also mentioned Tengyueh in Yunnan, with the addition of Yunnan Fu, which is present day Kunming at an elevation of 1900 m and surrounded by mountains rising as high as 3000 m. Of the two localities in southwestern Sichuan mentioned by Pope, Ningyuan and Lushuito, we could identify the former as present-day Xichang, just a little east of the Anning River, about 27°50' N, 102°15' E in a valley at about 1500 m and surrounded by mountains rising as high as 3000 m. We presume that Pope's Lushuito is the same locality as Luanshikau reported by Schmidt (1927), which was eastern (not southwestern) Sichuan in Pope's day.

In an article on a collection of reptiles from Sichuan 17 specimens were reported (Chang, 1932). They were collected by H. F. Hsü, T. K. Liu and others during a series of zoological field trips. Five originated from Chunking (now Chongqing) and were captured in the hills near the city at elevation of 500–700 m. Six were from Hochuan (Hechuan), 80 km northeast of Chongqing and collected on forested hillsides near the city at an altitude of 700 m. Both Chongqing and Hechuan are in present day Chongqing Municipality.

Three other specimens were from the hills outside the city of Chengtu (now Chengdu) in present day Sichuan Province at an altitude of 700 m, two others from forested hillsides at an elevation of 860 m near the earlier mentioned Mount Emei.

BMNH 1934.10.2.18 presented to the British Museum by Kingdom-Ward is from Rong To Valley, N. W. Ruma, southeastern Tibet, a place we could not identify (it might also be in Myanmar).

Jiang (2012, personal communication) made us aware that quite a number of these early records from the northern part of Sichuan Province were possibly *P. dhumnades* and misidentified as *P. nigromarginata*. This is probably true for many of the specimens described by Chang, as most of them were juveniles and subadults, and they were preserved in formalin and so severely damaged that only a few could be examined in detail (Chang, 1932). Nowhere is it mentioned that the colour of the snake is green, which is more or less diagnostic for this rat snake.

Also, we have our doubts about many of the specimens mentioned by Schmidt (1927), in particular those from Wanzhou. Although Schmidt stresses that the head scalation of *Z. dhumnades* and *Z. nigromarginatus* is 'almost identical' and the latter's number of ventrals and subcaudals is higher than that in *Z. dhumnades* specimens from Anhwei (now Anhui Province), it is not clear how they were distinguished. It was merely noted that they

'agree with Boulenger's diagnosis of this species'. Though all examined specimens were adult males, no mention is made of the green colour of the anterior body.

Current distribution according to provinces and geographic areas: It is remarkable that a majority of the early records (before 1935) were from relatively low elevations (500–915 m) in the hills bordering or in the Sichuan Basin. Due to political circumstances virtually no records are known from 1935 until about 1980. Most of the records starting in the 1980s are from relatively high (1000–2000 m) elevations in the mountains southwest and south of the Sichuan Basin and many of them are above 1500 m.

In their Red Data Book on Chinese Vertebrates Wang and Xie (2009) produced a locality-dot map for *P. nigromarginata*, but the dots are not backed-up with specifications about the localities. Despite the large number of localities, the authors regard the species as rare and declining in China. Most localities are in Yunnan Province, followed by southwestern Sichuan Province and southeastern Tibet. We searched primary Chinese sources for localities and 'identified' most of the dots on the map in the Red Data Book, and added a few more. All are mapped in Figure 1. Yet, we are aware that we are far from complete, as we could not identify several localities given in Chinese sources, and might have overseen publications in Chinese journals in which new localities were mentioned.

The records are summarized here according to provinces and municipality and to rough geographic areas. **Chongqing Municipality:** Chongqing Municipality came into existence in 1997 when it was carved out of Sichuan Province. New as the municipality may be, most (if not all) of the records date from the period before 1935 and are mentioned in the section above. They include the localities near Wanzhou at about 900 m, the hills around Chongqing City at 500–700 m and the hills around Hechuan at about 700 m.

In addition, Li *et al.* (2011) listed a specimen found in a collection of the Natural History Museum of Chongqing but they did not specify the locality from where it originated.

P. nigromarginata was not mentioned in a reptile diversity study in Chongqing Municipality, but the congener *Z. dhumnades* (Cantor, 1842) was (Luo *et al.* 2004). Neither is *P. nigromarginata* listed in a recent herpetofaunal survey in the Jinfoshan Nature Reserve in the south of Chongqing Municipality (Li 2010).

Chang Jiang (Yangtze River) Basin: In their study on reptile diversity in the Chang Jiang (Yu *et al.*, 2005),

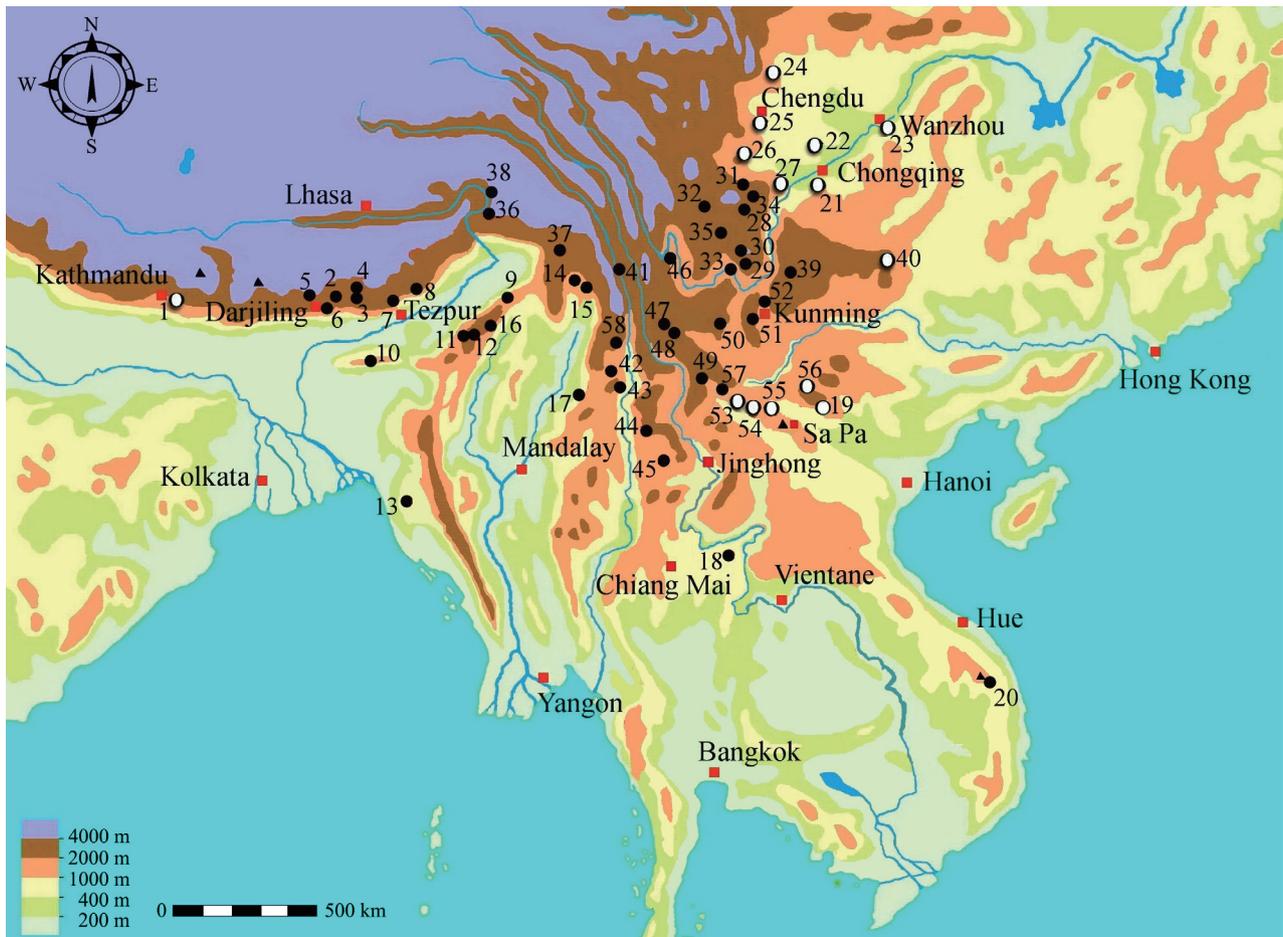


Figure 1 A locality dot-map, each dot representing a locality where *Ptyas nigramarginata* has been observed or collected. Black dots are for records of which we do not doubt the validity; white dots are for records that need confirmation (NNR = National Nature Reserve; NP = National Park; WS = Wildlife Sanctuary). **Nepal:** 1. Near Kathmandu. **Bhutan:** 2. 87 km north of Phuntsholing, 3. Bumdeling NP, Mongar District, 4. Bumdeling NP, Trashiyangtse District. **India:** Sikkim: 5. Teesta Valley; West-Bengal: 6. Darjiling; Arunachal Pradesh: 7. Eaglenest WS, 8. Talle WS and Lower Subansiri District, 9. Changlang District; Meghalaya: 10. Khasi Hills; Nagaland: 11. Dimapur District (Chumukedima) and Kohima District (Khonoma and Dzuleke), 12. Phek District. **Bangladesh:** 13. Chittagong Hill Tracts, Chittagong. **Myanmar:** 14. Hkakabo Razi NP, Putao, Kachin State, 15. Nam Tam Valley, Kachin State, 16. Naga Hills, Sagaing State, 17. Hutung, Kachin Hills, Kachin State. **Thailand:** 18. Doi Phu Kha NP, Nan Province. **Vietnam:** 19. Tay Con Linh, Ha Giang Province. 20. Kon Plong, Kon Tum Province. **China:** Chongqing Municipality: 21. Chongqing, 22. Hechuan, 23. near Wanxian; Sichuan: 24. Lungan/Jiangyou, 25. Chengdu, 26. Mount Emei, 27. Yibin, 28. Ningyuan/Xichang, 29. Huili, 30. Miyi, 31. Mianning, 32. Muli, 33. Panzhihua, 34. Xide, 35. Yanyuan; Tibet (Xizang): 36. Mêdog, 37. Zayü, 38. Bomi; Guizhou: 39. Weining, 40. Fanjing Mountain NNR; Yunnan: 41. Gongshan, 42. Tengchong, 43. Longling, 44. Cangyuan, 45. Menglian, 46. Lijiang, 47. Yangbi, 48. Dali, 49. Jingdong, 50. Chuxiong, 51. Yunnanfu/Kunming, 52. 30 km north of Kunming, 53. Huanglianshan NNR, 54. Jinping Watershed NNR, 55. Daweishan NNR, 56. Wenshan-Xiaoqiagou NNR, 57. Xinping County, 58. Gaoligongshan NNR.

the presence of *P. nigromarginata* is confirmed for three regions: the headwater of the Chang Jiang Basin (HY), the Jinsha Jiang-Yalong River (JY) and Yalong River-Dadu River (YD). HY covers a part of eastern Tibet from where dots are placed on the map in Wang and Xie (2009). JY covers the most eastern part of Tibet and most western part of Sichuan and also includes Zhongdian, Ninglang, Yongsheng and Huaping Prefectures of Yunnan, and all the headwater areas on the left bank of the Jinshan Jiang. YD stretches east of JY, separated from

the latter by the Yalong River, as far to the east as the city of Yibin on the Chang Jiang. The southern parts of JY and YD cover parts of Sichuan Province from where at least 8 records were mapped in Wang and Xie (2009). The Chang Jiang data add little to the data in Wang and Xie (2009), but suggest that the Min Jiang is the eastern limit of the species' range north of the Chang Jiang in present-day China.

Hengduan Mountains: In a report on the scientific expedition to the Hengduan Mountains 13 specimens of

P. nigromarginata were listed (Zhao and Yang, 1997). The length of these animals ranges 102.4–166.0 cm. The Hengduan Mountains comprise of an extensive range that occupies the easternmost part of Xizang (Tibet), much of western Sichuan Province and the northwest corner of Yunnan Province, with elevations ranging between 1300 and 6000 m and the highest summit of 7556 m. Subalpine conifer forest is the dominant vegetation type in much of this region. Five localities are mentioned: Gongshan and Tengchong in the westernmost part of Yunnan, west of the Nu Jiang (Nu River), and Yangbi near Dali, east of the Lancang Jiang (Mekong) in Yunnan. The other two localities are in the southwesternmost corner of Sichuan, that is, Huili and Xichang.

Tibet (Xizang): In addition to BMNH 1934.10.2.18 (see “Early records”) seven specimens were reported in a herpetological survey of the area around the 7782 m high Mount Namjagbarwa in the eastern Himalayas. They were collected in 1982 at elevations of 1480–2150 m (Zhao and Li, 1985). Mêdog or Motuo is the town closest to this mountain. Zayü, in the very eastern part of the Autonomous Region, and Mêdog are both mentioned as localities for *P. nigromarginata* in other reports (Hu *et al.*, 1987; Li, 2010). Also Zayü is surrounded by high rising mountains. Two more localities in Tibet are represented by dots in the map in Wang and Xie (2009), both about 100 km north of Mêdog, rather close to Mount Namjagbarwa. One of them probably refers to Bomi County. Recently a specimen was collected in Bomi (Bowo) County as well (Jiang, 2012, personal communication).

Sichuan: In addition to Chengdu, Huili, Jiangyou, Mount Emei, Xichang and Yibin mentioned above (Chang, 1932; Pope, 1934; Zhao and Yang, 1997) six other localities in Sichuan Province are listed in Zhao (2003): Miyi, Mianning, Muli, Panzhihua, Xide and Yanyuan. These are all situated in the southernmost corner of the province, predominantly mountainous watershed areas of the Yalong and Anning Rivers and their tributaries. These localities are all separated by less than 75 km from the other closest locality, which suggests that the populations in this area could be more or less continuous. We have little doubt about the validity of these records, in contrast to the older records in “Szechuan” (now Sichuan) mentioned before. Confirmation of several records would be welcome. Doubtful localities are marked as such in the map (Figure 1).

Yunnan: Two localities in Yunnan are specified in Zhao *et al.* (1998). Eight specimens were found in Jingdong in Central Yunnan’s Wuliang Range, about 40 km east of the Lancang Jiang with Mount Maotou, the highest

peak at 3306 m, nearby. Two were from Gongshan, in the mountainous northwest corner of the province. An altitudinal range of 1500–2000 m is mentioned. The largest of the ten specimens is 218 cm long. In Yang and Rao (2008) another six localities in Yunnan are mentioned. Of these Tengchong and Longling are situated in mountainous areas west of the Nu Jiang, not far from Myanmar’s Kachin State. Yangbi and Dali are east of the Lancang Jiang surrounded by mountains with nearby Dianding Shan rising 4122 m high. Chuxiong and Kunming are in Central Yunnan. Cangyuan and Menglian were mentioned in Zhao and Yang (1997), these are predominantly mountainous areas between the Nu Jiang and Lancang Jiang near Myanmar’s Shan State. Menglian is the southernmost locality known in China.

An appendix in Yang and Rao (2008) contains a checklist for 12 national nature reserves and 6 other localities in Yunnan. *P. nigromarginata* occurs in most and we could identify six of them. Four are reserves in the southeastern part of the province near the Vietnamese border. The Huanglianshan National Nature Reserve is at about 22°55' N, 102°15' E in the central part of Lüchun County, in fact a southern extension of the Ailao Range, predominantly at elevations of 1300–2200 m and covered with primary subtropical broad-leaved evergreen forest.

The Jinping Watershed National Nature Reserve in Jinping County is east of the latter, near the Vietnamese border and only 100 km northwest of Sa Pa in Vietnam. The Daweishan National Nature Reserve is situated between Pingbian and Hekou (about 22°36' N, 103°45' E) and is less than 100 km north of Sa Pa across the border in Vietnam. The Wenshan-Xiaoqiaogou National Nature Reserve is in the southeastern corner of the province.

Another locality in the Ailao Range is west of Xinping, about halfway between Jingdong and Lüchun, other localities in this range.

At last *P. nigromarginata* is known to occur in the Gaoligongshan National Nature Reserve, a 135 km long mountainous area stretching on the west bank of the Nu Jiang near the Myanmar border. However, it is possible that this locality and the earlier mentioned Tengchong actually refer to the same record(s).

One of us (G. Vogel) found specimens close to Lijiang, Yunnan (this paper, see below), a location in China from where it has not been reported thus far. Lijiang is surrounded by high rising mountains, Yulongxue Shan, the highest peak nearby, at 5596 m.

We have doubts about the records in the southern Yunnan close to the Vietnamese border. It is well possible that *P. dhumnades* occurs in this part of the province and

that young and subadult specimens have been confused with *P. nigromarginata*. These localities are also marked as doubtful in the map.

Guizhou: In Guizhou Province this species was formerly only known from Weining in the northwestern part bordering with Yunnan, where it was reported from elevations of 2220 to 2290 m (Wu *et al.*, 1985). Of the 15 specimens listed, the largest measured 195 cm. Weining is surrounded by mountains with peaks as high as 2556 and 2645 m. Recently *P. nigromarginata* was also collected in the Fanjing Mountain National Nature Reserve (about 27°50' N, 108°30' E) in the northeastern corner of the province (Lei *et al.*, 2011). This is by far the easternmost locality known and extends the range in China as far as 108° E. The reserve consists predominantly of mountainous areas with the highest peak at 2494 m. The species was reported to be rare in the reserve. Although the mentioned habitat seems to fit the known habitats of *P. nigromarginata* well, we believe that confirmation of these latter records is also welcome.

Taiwan: Specimen BMNH 1910.12.31.1 is a little snake presented to the British Museum by Major (later: Col.) F. Wall that originates from Central Formosa (now Central Taiwan). It was labeled as *Z. nigromarginatus* and shows a snake with a dark bluish brown dorsum and a much paler greyish-blue belly, the most anterior part and the chin being almost white or cream. On each side a pair of dark lateral stripes can be distinguished, a broad paravertebral stripe and a narrower ventrolateral stripe occur, which are separated by a much lighter lateral stripe. There is also a pale vertebral stripe separating the two dark paravertebral stripes. In all other aspects, such as head scalation, the little snake resembles *P. nigromarginata*. If this turns out to be a valid record, the range of the latter would have extended eastwards for at least 2000 km. However, the Formosan specimen almost certainly is a juvenile *P. dhumnades*, of which the pattern is strikingly similar to that of juvenile *P. nigromarginata*, while minor differences in colour have disappeared due to preservation. This interpretation is supported by a second label on the glass containing the specimen, reading *Z. oshimai* (Stejneger, 1925) as *Z. dhumnades* from Taiwan was known in the former days.

BMNH 1953.1.2.79 from Taipei in Taiwan and presented to the museum by H. G. Schenck was initially labeled "*Ptyas nigromarginatus oshimai*". It is an adult rat snake lacking a double pair of dark stripes, definitely not a *P. nigromarginata*, but probably a Taiwanese representative of *P. dhumnades*. The mislabeling was realized later, as "*nigromarginatus*" was placed in

brackets.

There is no evidence that *P. nigromarginata* has ever been recorded in Taiwan and such an eastern distribution would be really surprising.

3.1.9 Elsewhere in Southeast Asia *P. nigromarginata* has thus far not been reported from Cambodia, Thailand and Laos. Thailand, Malaysia, Indonesia and the Philippines are erroneously listed in a number of Chinese works (Zhao and Yang, 1997; Zhao, 2003; Yang and Rao, 2008). Laos is listed by Nguyen *et al.* (2009), but there is no reference or voucher specimen for Laos thus far (Teynié and David, 2010). It is very likely to occur in the herpetologically underexplored mountains of northern Laos, adjacent to the areas in Vietnam and China (Yunnan) where the species has been reported. The recent record in Thailand's Nan Province (see below) to the southwest of northern Laos makes this all the more likely. Following the record from Kon Tum Province in Vietnam, the adjacent highlands of southern Laos (in the provinces of Attapu and Sekong) is another area where the species may be expected. This may also be true for the mountains of Cambodia's Ratanakiri Province, but other parts of Cambodia seem to us very unlikely candidates. The recent record in Nan Province adds the species to the herpetofauna of Thailand (see below).

3.1.10 Altitudinal distribution The altitudinal distribution of *P. nigromarginata* as given by various authors is summarized in Table 1.

A lower limit of 300 m is most probably erroneous. We consider an elevation of 500 m near Chongqing and in Tibet as the lowest possible localities known.

3.2 New records

3.2.1 Thailand An adult Green Rat Snake (*P. nigromarginata*) was spotted and photographed (Figures 2–4) on 14 May 2012 in the Doi Phu Kha National Park, Nan Province (about 19°10' N, 101°05' E. Elevation: 1550 m a.s.l.; with dense evergreen forest), in the eastern part of North Thailand, about 20 km from the Laotian border. Most of the National Park consists of mountains, with a number of peaks rising 1650–1950 m. Highway 1256 cuts through the mountains and the National Park from its eastern to the western border.

It was about 11:00 h on a sunny morning, when one of us (S. Hauser) spotted the snake on the side of the road. Apparently, it had just emerged from the surrounding evergreen forest and was about to cross the road. It disappeared into the undergrowth, but a few seconds later the snake reemerged just a meter from the author and froze in the position in which it was photographed. It did not seem to be very shy and the author could even stalk to



Figure 2 An adult specimen from Nan Province, the first record of *Ptyas nigromarginata* in Thailand. Photo by Sjon Hauser.



Figure 3 The head and neck of the Nan specimen of *Ptyas nigromarginata*. Photo by Sjon Hauser.



Figure 4 The forest in the Doi Phu Kha National Park in Nan where the species was recorded. Photo by Sjon Hauser.

the other side of the snake to take more pictures. It stayed in that position for more than four minutes. However, when a rumbling truck passed by, it fled into the vegetation again, and it was then that the striped posterior part of the body and the tail were seen. It did not reappear again. The snake was estimated to be about 150–160 cm long.

Colouration of the Thai specimen: The upper part of the head is light brown and contrasts sharply with the snow white throat. The eyes are blackish-brown with round, black pupils (Figure 2). The dorsal body is green, mossy medially and pale green laterally, the latter colour extends to the corners of the otherwise cream ventral shields. There is a golden yellow patch on the throat and neck at the back of the jaw. This highly characteristic head colouration is not mentioned in the older sources (e.g., Günther, 1864), but can be distinguished in nearly all photographs of more recently recorded living adult specimens, as in the one from Lijiang, Yunnan, China, see below (Figures 5, 6). The presence of well-developed keels in the two (or three) medial pairs of rows of dorsal scales, considered to be diagnostic for the species (Günther, 1864), can hardly be distinguished in the pictures (Figure 3). The last part of the body and the tail has two pairs of black stripes with pale grey in between. This was observed when the animal disappeared in the low vegetation, but was not photographed. However, a picture was made of the small golden yellow intermediate zone between the green body and black-and-white tail.

Head scalation: Nine supralabials can be distinguished, with the fifth and sixth ones touching the eye, and the seventh and eighth being the largest. There are two preoculars, the lower one very small, one supra-ocular, two postoculars and one loreal (Figure 3). On the right side this is the same. With its nine supralabials (of which the fifth and sixth touch the eye) the specimen differs from the descriptions in Günther (1864), Boulenger (1893), Wall (1909b) and Smith (1943) that all mention eight supralabials (of which the fourth and fifth touch the eye). In this aspect it also differs from the specimen from Lijiang (see below) and ten other Yunnanese specimens listed in Yang and Rao (2008), all with eight supralabials (the fourth and fifth touching the eye). The remaining scalation of the head is in accordance with the formulas given by Günther (1864) and others.

Habitat: The park's dense evergreen (montane) forest where the specimen was spotted (Figure 4) is known as 'ancient forest' due to the occurrence of a number of rare tree species, such as the endemic Single Stem Fish-tail Palm (*Caryota gigas*), and flowering tree *Bretschneidera*



Figure 5 *Ptyas nigromarginata* from Lijiang City, Yunnan Province, China. Photo by Gernot Vogel.



Figure 6 The head of the Lijiang specimen of *Ptyas nigromarginata*. Photo by Gernot Vogel.

sinensis, a rare relict species only known from a few sites in southern China and northern Vietnam (Santisuk, 1989; Goodden, 1999; Gardner *et al.*, 2000). A relatively short stretch of the road through the National Park is surrounded by this type of dense forest. Before the completion of the highway in the late 1980s this forest was hardly reached by earlier naturalists (Santisuk, 1989). Just a few kilometers from the site the forest is much disturbed or replaced by extensive swidden of hill tribe farmers.

3.2.2 China Several adult specimens of *P. nigromarginata* were collected by forest workers in a place near Lijiang City, Yunnan Province on 15 May 2010, and one specimen, measuring about 130 cm, was photographed by one of us (G. Vogel) on the same day.

Colouration and body scalation: In Figure 5 it can be seen that the interstitial skin is black. Six median rows of dorsals are keeled, whereas rows of dorsals are even numbered over most of the body length. Anteriorly the

snake is green, posteriorly white or very pale green with two pairs of black stripes, with the median pair being broader than the lateral pair. At about two thirds of the total length from the tip of the tail, there is an intermediate zone in which the stripes fade away and the body colour becomes more or less uniformly green anteriorly. Towards the end of the tail the white stripes break up into rows of ellipsoid dots, reminding the tail's end of the congener *P. carinata* (Günther, 1864).

Head scalation and colour: Eight supralabials can be distinguished, with the fourth and fifth touching the eye, and the seventh and eighth being the largest. There are two preoculars, one loreal, one small scale below the loreal, one supra-ocular and two postoculars, two anterior and two posterior temporals. The eye is black, mottled with tiny, pale streaks; the pupil is round and uniformly black. The colouration of the head is somewhat different from the Nan specimen. The upper part is bronze. The rostrum, supralabials and a number of scales around the back of the jaw are yellow. The remaining scales, those behind the parietals and postoculars are green, some of them with narrow, bluish-green edges. The interstitial skin is black. The throat is white with the exception of the last infralabial and adjacent scales, which are yellow, but there is no distinct 'golden patch' like in the Nan specimen (Figure 6).

Habitat: The specimen was captured in a montane forest, where it was active on the ground during the day. In the same habitat a *Macropisthodon rudis rudis* Boulenger, 1906 was found.

4. Discussion

From the data on records of *P. nigromarginata* in the literature and internet sources and additional information given by authors arises the picture that the species is widely distributed over a large area of the Himalayas and its foothills extending from Nepal to the southwestern part of eastern Tibet, China, and far into mountain ranges running east of it in southwestern China (Sichuan, Yunnan and Guizhou) and south and southeast of it in India, Bangladesh, Myanmar, Thailand and Vietnam. Regarding its altitudinal distribution it seems to be restricted to elevations of above 500 m with an upper limit at about 2300 m. Its preferred habitat predominantly consists of temperate forests (often with conifers) in the northern parts of its range and montane forest or dense hill evergreen forest in the southern parts.

In the most northern part of its range, the hills around the Sichuan Basin, the species was reported from

Table 1 The altitudinal distribution of *Ptyas nigromarginata* according to various sources. * A lower limit of 300 m is probably erroneous. We consider an elevation of 500 m near Chongqing and in Tibet as the lowest possible localities known.

Height	Locality	Country	Reference	Remarks
1740–2165 m	Whole area		Günther, 1860	Mixture of species
Up to 2165 m	Whole area		Günther, 1864	
Up to 2165 m	Whole area		Boulenger, 1893	
1220–2165 m	Whole area		Boulenger, 1890	
1885 m	Whole country	Bhutan	Wangyal, 2011	
1700 m	87 km north of Phuntsholing	Bhutan	Bauer and Günther, 1992	
1350 m	Kachin State, Putao District	Myanmar	CAS 224386	
1370–1525 m	Khasi Hills	India	Wall, 1908	
1450–1700 m	Sikkim	India	Chettri <i>et al.</i> , 2009	
1250–1950 m	Arunachal Pradesh	India	Agarwal <i>et al.</i> , 2010	
500–860 m	Chongqing and Sichuan	China	Chang, 1932	
500–2000 m	Whole country	China	Zhao, 2006	
1500–2000 m	Whole country	China	Zhao <i>et al.</i> , 2008	
300*–2000 m	Whole country	China	Wang and Xie, 2009	
2220–2290 m	Guizhou	China	Wu <i>et al.</i> , 1985	
1500–2200 m	Sichuan	China	Zhao, 2003	
915 m	Chongqing	China	Schmidt, 1927	
500–2000 m	Tibet	China	Li <i>et al.</i> , 2010	
1550 m	Doi Phu Kha National Park, Nan	Thailand	This work	

relative low elevations of 500 to 1000 m. All records from this area we are aware of were from before 1935, which may suggest that the species has become locally extirpated or extremely rare due to habitat destruction and hunting following population expansion from the Basin into the hills. Another explanation is that most of the relative low records around the Sichuan Basin are in fact not valid, as the specimens were confused with *P. dhumnades*. Only in Tibet, records of the species at such low elevations have been confirmed (Jiang, 2012, personal communication).

Interestingly, though the species was recorded from habitats at elevations ranging between 500 and 2300 m, the large majority of records originated at 1000–1800 m, nearly all localities known are adjacent to mountains which extend to much higher elevations. With some reservation we therefore speculate that the species needed higher elevations than the present altitudinal range to survive during previous (Pleistocene) periods when wet, evergreen forests in the region were largely restricted to higher elevations compared to the present situation. With the possible exception of a few localities, nowhere in its range this snake seems to be common. An important factor related to its apparent rareness is its preference for dense, pristine forests and avoidance of human habitations and settlements. Furthermore, several specimens over 240 cm long have been recorded (e.g., Günther, 1864; Grewal *et al.*, n.d.), and one from Arunachal Pradesh even measuring 277 cm (Agarwal *et al.*, 2010), are evidence that it is a rather large species. Low population densities

are to be expected for such a rather large predator, in particular in primary forest.

However, the large specimens of “*Z. d. nigromarginatus*” from Sa Pa in Vietnam, measuring 306, 266 and 256 cm long and all collected by Bourret in the 1930s, cannot be referred to *P. nigromarginata* as Bourret determined them. Their ‘brownish red or brick dorsal band’ and brown as its basic colour clearly distinguish them from *P. nigromarginata*. They are much more similar to *P. dhumnades* despite their large number of ventrals (209–210), and their exceptionally large size.

In the past, these two species have been confused because they were identified only from preserved specimens in which the colours faded to some degree. The green colour of the anterior body of a good number of adult and subadult specimens collected in India in the 19th century, has however not faded away, and misidentification in the past may therefore have resulted from neglecting of this diagnostic character. Another factor is that the juveniles of both species look strikingly similar, both having two pairs of black lateral stripes over much of their body and tail.

In recent Chinese records, the length of *P. nigromarginata* ranges from 96.5–217.8 cm (excluding one juvenile) and the number of ventrals (excluding one count of 186) from 192–206 (Wu *et al.*, 1985; Zhao and Yang, 1997; Zhao *et al.*, 1998; Yang and Rao, 2008). The data of Bourret’s Sa Pa specimens have been cited in a number of later works and inflated the true length of the species. Yet the total picture arises of a large specimen

reaching a length of 220 cm, with occasional records of longer specimens (up to 277 cm).

We have not found clear evidence that *P. nigromarginata* and its congener *P. dhumnades* are sympatric anywhere in their range. The known range of *P. dhumnades* occupies much of eastern mainland and Taiwan of China, and is well separated from the most eastern extension of the range of *P. nigromarginata* in China's Guizhou Province. However, *P. dhumnades* has been reported from Chongqing Municipality, where *P. nigromarginata* was recorded in the early 20th century. What's more, one of us (G. Vogel) has recorded a dark snake from a snake farm close to Chengdu, Sichuan Province, which resembles *P. dhumnades* (unpublished data), while *P. nigromarginata* was possibly also known from Chengdu in the early 20th century.

Bourret's specimens from Sa Pa (Lao Cai Province, Vietnam) and a specimen from Vietnam's Lao Cai in Nguyen *et al.* (2009) probably represent the most southeastern extension of the range of *P. dhumnades*, or may even represent a distinct, isolated taxon, but it is beyond the scope of this article to throw light upon this question. Lao Cai is close to the most southern parts of China's Yunnan Province where *P. nigromarginata* has been recorded.

Showing pictures of the Nan specimen (Thailand) to park rangers and other persons living near the site where it was spotted, all stated that they had never seen a snake like this before. The record of *P. nigromarginata*, as well as the recent rediscovery of the Angel's Keelback *Paratapinophis praemaxillaris* Angel, 1929 in the northernmost corner of the Doi Phu Kha National Park (Murphy *et al.*, 2008) underscore the limited knowledge of the herpetofauna in this part of northern Thailand and the need of further exploration. Yet, the single find suggests that *P. nigromarginata* is extremely rare or localized in northern Thailand.

Only in some parts of Yunnan and Sichuan of China and northern India the species is apparently not uncommon. In Sikkim (India) 'villagers often kill them', as they believe that this particular snake will remember the person who tried to hurt it and will chase after him (Chettri, personal communication). Also in the Talle Valley (Arunachal Pradesh, India) it seems not to be rare, as expedition members found three specimens within a period of one week. And the reported specimen from Lijiang was among at least five other specimens captured in nearby forest, suggesting that the species is not uncommon in that part of Yunnan. Also in southern Sichuan the species does not seem to be very rare, as is

indicated by the numbers of specimens reported.

It is very difficult to draw conclusions about population densities from incidental records (Van Rooijen, 2009). Sometimes sizable populations turn out to exist in areas where no or very few sightings have been reported despite extensive searching (Mattison, 1995). Most sightings of *P. nigromarginata* were during sunshine in the morning, yet such periods of activity may be fairly restricted over a long span of time. Regardless of the pronounced seasonal variation of snake activity, it is known that the frequency of sightings of certain species may greatly fluctuate for unknown reasons (Pauwels *et al.*, 2003).

Orlov *et al.* (2003) commented on the tropical snake fauna that an extremely rare repetition of records is characteristic in a number of species. The reasons for this fact are the low numbers and density, nocturnal activity, a mosaic distribution in tropical habitats and the difficulty of permanent observations during the different seasons in many species. However, we expect more records of *P. nigromarginata* in areas that are herpetologically little explored, in particular northern Laos and Shan State of Myanmar. It is not really clear if the distribution range is disjunct or if there are just a number of collecting gaps. But at least in Vietnam there seem to be significant distribution gaps as the species obviously does not occur at Tam Dao, an extremely well-surveyed high altitude place relatively close to and continuous with Tay Con Linh Mountain and southern Yunnan where the species occurs.

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