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A NEW MONTANE SPECIES OF THE GENUS *Pareas* WAGLER, 1830 (SQUAMATA: PAREATIDAE) FROM NORTHERN MYANMAR

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Abstract

A new species of the genus *Pareas* is described from northern Myanmar. It differs from all other known species of the genus by coloration, which is mainly uniform, and its size (one of the largest species in the genus). Furthermore it is characterized by a low number of supralabials (six), a loreal that touches the orbit, presence of a presubocular and absence of a preocular. The new species was found at an elevation of 1890 m a.s.l. and is regarded as an inhabitant of high elevation mountainous areas.

Keywords: Asia, Colubroidea, Oriental region, *Pareas vindumi* **sp. nov.**, taxonomy

Introduction

The genus *Pareas* Wagler, 1830 is widely distributed in the Oriental region. Since the description of *Pareas nigriceps* Guo & Deng, 2009 and the revalidation of *Pareas chinensis* (Barbour, 1912) by Guo *et al.* (2011) the genus currently comprised 11 species. Although there have been several revisions (Rao & Yang 1992, Ota *et al.* 1997, Guo & Deng 2009, Guo *et al.* 2011), its phylogeny is only partially known (Guo *et al.* 2011). Several species groups of the genus await clarification of their systematics and an increase in the species number can be expected. Astonishingly, little is known about the natural history of the members of this genus, despite the fact that in some areas, species of

this genus are quite common. Together with the monotypic genus *Aplopeltura* A. Duméril, 1853, and *Asthenodipsas* Boie, 1827, with five species (Loredo *et al.* 2013), *Pareas* is included in the family Preatidae (Pyron *et al.* 2011). Snakes of the genus *Pareas* are mainly arboreal, nocturnal, and feed generally on slugs and snails (Götz, 2002).

In 1999, the National Science Foundation funded a joint three-year collaboration between the Nature and Wildlife Conservation Division, Forestry Department of Myanmar, the California Academy of Sciences, and the Smithsonian Institution, to catalogue the amphibian and

reptile species of Myanmar. The core of the project was specimen-based surveys conducted primarily by a trained field team chosen from employees of the Nature and Wildlife Conservation Division, Forestry Department. In the course of this project, a large unusual specimen of the genus *Pareas* was collected and deposited in the collection of the CAS, which subsequently herein is described as a new species.

Materials and Methods

The specimen of the undescribed species was compared with a total of 128 preserved specimens of all known species of the genera *Pareas*, *Asthenodipsas* and *Aplopeltura* with the exception of *Pareas iwasakii* from Japan. The external morphological characters and coloration of all the specimens were examined in detail, and the examined materials are listed in Appendix 1.

A total of 40 morphological characters were recorded for each specimen (see Appendix 2). Not all of these characters were useful to distinguish between species in this study, but all of them were compared because they may be of use for further taxonomic studies.

Measurements were taken with a slide-caliper to the nearest 0.1 mm, except body and tail lengths, which were measured to the nearest of one millimeter with a measuring tape. The number of ventral scales was counted according to Dowling (1951). Half ventrals were counted as one. The first enlarged shield anterior to the ventrals was regarded as a pre-ventral and was present in all examined specimens. The first scale under the tail meeting its opposite was regarded as the first subcaudal, and the terminal scute was not included in the number of subcaudals. The dorsal scale rows were counted at one head length behind head, at mid-body, and at one head length before vent. In the number of supralabials touching the subocular, those only touching the presubocular were not included. Infralabials were considered being those shields that were completely below a supralabial and bordering the mouth gap. Usually the last supralabial shield was a very large shield, much larger than other supralabials. Smaller shields behind this enlarged shield do not border the mouth gap (only the connecting muscle) and were excluded in the sublabial scales count, despite the fact that they were

covered by the supralabials. The first sublabial was defined as the scale that starts between the posterior chin shield and the infralabials and that borders the infralabials. Values for paired head characters were recorded on both sides of the head, and were reported in a left / right order. The sex was determined by dissection of the ventral tail base.

Museum abbreviations: BMNH: The Natural History Museum, London, UK; CAS: California Academy of Sciences, San Francisco, USA; CIB: Chengdu Institute of Biology, Chengdu, People's Republic of China; DL: Ding Lee's private collection, Chengdu, People's Republic of China; FMNH: Field Museum of Natural History, Chicago, USA; MNHN: Muséum national d'Histoire naturelle, Paris, France; MZB: Museum Zoologicum Bogoriense, Bogor, Java, Indonesia; NMW: Naturhistorisches Museum Wien, Vienna, Austria; PSGV: Gernot Vogel's private collection, Heidelberg, Germany; RMNH: Nationaal Natuurhistorisch Museum (Naturalis), Leyden, The Netherlands; SMF: Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt-am-Main, Germany; ZFMK: Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany; ZMA: Zoologisch Museum Amsterdam, Amsterdam, The Netherlands; ZMB: Zoologisches Museum für Naturkunde der Humboldt-Universität zu Berlin, Berlin, Germany; ZSM: Zoologische Staatssammlung, München, Germany.

Other abbreviations: SVL: Snout-vent length; TaL: Tail length; TL: Total length; Rel TL: Relative tail length TaL/TL, Ve: ventral scales; Sc: subcaudal scales; Lo: loreal scale.

Results

Pareas vindumi sp. nov. (Figs. 1–3)

Holotype: adult female (527 mm SVL), CAS 248147 (field number CAS-MHS-28983); Chipwi Township, Lukpwi village (25°42'41.7996"N, 98°19' 22.7994"E, 1890 m asl), Kachin State, Myanmar, coll. M. Hlaing, S. L. Oo, Z. H. Aung, K. S. Lwin, and Y. M. Win, 28 July 2009.

Diagnosis: A species of the genus *Pareas* characterized by a large size (in the single known specimen 657 mm); loreal widely touching orbit; vertebral scales smooth and not

enlarged; dorsal scales smooth; 178 ventrals in the single known female, males unknown; 61 subcaudals in the single known female; relative TL 0.198 in the single known female; 6 supralabials with SL 3–4 touching the subocular; 6 infralabials, first ones touching behind the mental shield; no pre- or postocular, one presubocular; 2 anterior temporals; body pattern uniform and no markings on the head, no collar. The new species can be diagnosed by its large size, low number of supralabials and infralabials, and unusual uniform pattern for this genus.

Description of the holotype: Female, SVL 527 mm; TaL 130 mm; TL 657 mm; Rel TL: 0.198. Body elongate, laterally compressed; head distinct from the neck, snout blunt; eye moderate, dark. Rostral slightly visible from above; a single nasal; two internasals, widely in contact with each other with a diagonal suture; two large irregular pentagonal prefrontals, much larger than internasals and with a slightly diagonal suture between; one pentagonal-shaped frontal, longer than wide, smaller than parietals; no preocular; no postoculars; one triangular presubocular, touching second and third supralabials, loreal and orbit; one subocular, surrounding about one third of the eye, touching the supraocular; 1/1 loreal, broadly touching eye, longer than wide, elongated, in contact with second supralabial, presubocular, prefrontal, internasal and nasal; 6/6 supralabials, 3rd and 4th SL touching the subocular, none reaching the eye, 6th by far the largest, elongate; 1/1 supraocular; 2/2 anterior temporals and 3/3 posterior temporals; 6/6 infralabials, 1st pair in contact with each other. Dorsal scales in 15-15-15 rows, smooth. Vertebral row not enlarged. No apical pits. 178 Ve (+ one preventral); 61 Sc; cloacal plate single.

Etymology: This species is named in honour of Jens Vindum (CAS, San Francisco, USA), for his enormous contributions to the CAS expeditions to Myanmar. I suggest the following common names: Vindum's Slug Eater (English), Vindums Schneckenfresser (German).

Colour in preservative: Head and body chocolate-brown with very fine dark and pale specklings, only visible in close-up view; no markings or bands on the body and head; head the same colour as body, paler in the temporal region, whitish-cream on upper and lower labials, head sides with fine speckles, more intense on

the sutures of the upper labials and in the temporal region; lower labials also speckled but less intensively than supralabials; eye black; underside of head coloured like ventral side of the body, also with fine speckles. Venter whitish-cream with fine specklings, more concentrated to the base of the ventrals. Tail coloured like body, ventrally heavily speckled.

Distribution and natural history: *Pareas vindumi* **sp. nov.** is currently only known by an unique specimen from the Chipwi Township region of Kachin State, Myanmar. It should be expected in the surrounding mountainous areas and in neighboring Republic of China. The holotype was found at an elevation of 1,890 m a.s.l., at about 9.00 PM. Nothing else was recorded, but obviously this is a species living at high elevations. No further information is known on the biology of this species.

Discussion

In Guo & Deng (2009), the new species keys out as *P. monticola* (Cantor, 1839). The pholidosis is most similar to *P. boulengeri* (Angel, 1920). However both species have a banded pattern and distinct neck- and head markings as well as more supralabials and more infralabials (Figs. 4 & 5). I refrain from providing a new key, due to the fact that several publications on this genus are about to be published and the key would be outdated shortly after it is printed.

Pareas vindumi **sp. nov.** can be distinguished from the other members of the genus *Pareas* as follows (values of *P. vindumi* **sp. nov.** vs. the compared species in brackets). Only the most diagnostic differences are listed. The data of the compared species were taken from specimens listed in Appendix 1 and for *P. iwasakii* from Guo & Deng (2009): *Pareas vindumi* **sp. nov.** differs from all other described *Pareas* species by its the colouration. Furthermore it differs from *Pareas margaritophorus* (Jan, 1866) and *P. macularius* Theobald, 1868 by the much higher number of Sc in the single known female (61 vs. only 34–45 in females), by the Lo touching the orbit (vs. not touching), by the presence of a presubocular (vs. absence) and by the absent preocular (vs. present).

Pareas vindumi **sp. nov.** differs from *P. carinatus* (Boie, 1828) by the preocular absent (vs. present), by the prefrontal bordering the eye (vs. not bordering) and by the number of

infralabials (6 vs. 7–10). From *P. nuchalis* Boulenger, 1900 it differs by its larger size, the number of Ve (178 vs. 195–213), a much lower number of Sc (61 vs. 105–113), in the labials not bordering the eye (vs. bordering), the Lo touching the eye (vs. not touching), and by the lack of a preocular (vs. present).

From *P. boulengeri* (Fig. 4) it differs by the lower number of supralabials (6 vs. 7–8), by the fact that only two supralabials touch the sublabial (versus usually 4 rarely 3); by the presence of a presubocular (vs. none) and by the lower number of infralabials (6 vs. 8 or rarely 7 or 9). *P. boulengeri* has a totally different colouration. In *Pareas vindumi* **sp. nov.**, there are no postocular stripes (against 2), there is no mask like mark in the neck (against such a mark present) and there are no bands on the body (against 38–48 bands in the three types of *P. boulengeri*). The subcaudals are heavily mottled in *Pareas vindumi* **sp. nov.** (against a few scattered spots). There is considerable confusion in the literature about the determination of the species *P. boulengeri*, *P. chinensis*, *P. monticola* and *P. formosensis*. So the new species was explicitly compared to the syntypes of *P. boulengeri*.

From *P. monticola* (Fig. 5) it differs by the lower number of Ve (178 vs 182–189) and Sc (61 vs. 69–72, 84 in the holotype of *Amblycephalus monticola* [Boulenger, 1896]), by the lower number of supralabials (6 vs. 7), by the lower number of infralabials (6 vs. 7–9), and by the absence of a postocular (vs. presence).

P. monticola has a totally different colouration. In *Pareas vindumi* **sp. nov.**, there are no postocular stripes (against 2), there is no mask like mark in the neck (against such a mark present) and there are no bands on the body (against 48–60 bands in three females of *P. monticola*). The subcaudals are heavily mottled in *Pareas vindumi* **sp. nov.** (against a few scattered spots).

From the *P. chinensis* / *formosensis*-complex it differs by its larger size, by the lower number of Sc (61 vs. 65–80), by the lower number of supralabials (6 vs. 7–8), by the lower number of infralabials (6 vs. 7–9), by the Lo touching the eye (vs. not touching) and by the presence of a presubocular (vs. none).

From *P. nigriceps* it differs by the lower number of supralabials (6 vs. 7), by the lower number of infralabials (6 vs. 7), by the smooth dorsal scales (vs. keeled in the 9 median rows) and by the not enlarged vertebral scales (vs. enlarged). *P. nigriceps* furthermore has a very characteristic coloration.

From *P. stanleyi* (Boulenger, 1914) it differs by the higher number of Ve (178 vs. 151–160), by the smooth dorsal scales (vs. keeled in the 13 median rows), by the not enlarged vertebral scales (vs. enlarged), by the presence of a subocular (vs. absent) and by the lower number of infralabials (6 vs. 7–9).

From *P. hamptoni* (Boulenger, 1905) it differs by its shorter tail (Relative TL 0.198 vs 0.242–0.291), by the lower number of Sc (61 vs. 73–108), by the lower number of supralabials (6 vs. 7–8), by the Lo touching the eye (vs. not touching) and by the absent preocular (vs. present).

Finally it differs from *P. iwasakii* (Maki, 1937) by its lower number of Ve (178 vs. 189–194), by the lower number of Sc (61 vs. 72–81), by the smooth dorsal scales (vs. keeled in the 5–7 median rows), by its vertebrals not enlarged (vs. enlarged) and by the lower number of infralabials (6 vs. 8–9).

Currently *Pareas vindumi* **sp. nov.** cannot be assigned to any species group in this genus, and based on the pholidosis it seems to be an isolated species. Very surprising is the high elevation of 1890 m a.s.l. at which the specimen was found. Only few snake species are known from such high elevations in Myanmar.

The discovery of several new species is not surprising considering the isolated geographical situation of the area, located between the Irrawaddi River and the Hengduan mountains area and the paucity of collections. More new species can be expected when the collected material has been worked through. Four more new snake species were described as a result of the CAS expeditions to Myanmar: *Naja madalayensis* Slowinski & Wüster, 2000, *Lycodon zawi* Slowinski, Pawar, Win, Thin, Gyi, Oo & Tun, 2001, *Python kyaiktiyo* Zug, Gotte & Jacobs, 2011, and *Dendrelaphis walli* Vogel and van Rooijen, 2011.

At present, five species of the genus *Pareas* are definitely known from Myanmar: *P. carinatus*, *P. hamptoni*, *P. margaritophorus*, *P. macularius* and *Pareas vindumi* sp. nov. *P. macularius* was regarded as a synonym of *P. margaritophorus* by several authors (Huang 2004, Guo & Deng 2009). A review of the *P. margaritophorus* complex is underway. *P. monticola* was found close to the border of Myanmar in Mizoram Province, India (Laltanpuia, et al. 2008; own observations, Fig. 5) and can be expected to be found in Myanmar.

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Appendix I: Examined material

(Localities as given with the specimens)

- Aplopeltura boa* (2 specimens): **Indonesia**: ZSM 512/1909 “Batang Kwis, Sumatra”; ZSM 363/1920 “Nias”.
- Asthenodipsas laevis* (11 specimens): **Indonesia**: MZB 2728 “Bukit Lawang Sumatra”; NMW 13382, NMW 21823:2 “Padang, Sumatra”; RMNH 986A–C (**Lectotype and paralectotypes** of *Amblycephalus laevis*) “Java”; SMF 20788–89 “Ranau, Sumatra”; SMF 81195 “Sumatra”; ZMA 16245 “Banka”; ZSM 126/1947 “Niederländisch Indien”.
- Asthenodipsas lasgalensis* (3 specimens): **Malaysia**: ZFMK 53098 “Cameron Highlands, Tanah Rata”; ZMB 57112–13 “Cameron Highlands, zw. Markt und Trinkat”.
- Asthenodipsas malaccanus* (10 specimens): **Indonesia**: MNHN 1939.0201–0204 (**Syntypes** of *Asthenodipsas malaccanus ventrilineatus* Angel, 1941) “Batavia, Java”; MZB 3592 “Bengkulu, Sumatra”; NMW 28126:1–2 “W-Sumatra”; ZSM 143/1907 “Maveling, W-Borneo”; **Malaysia**: SMF 32580 “Perak”; **Thailand**: ZFMK 45131 “Satun”.
- Asthenodipsas tropidonotus* (5 specimens): **Indonesia**: MZB 1816 “Mt. Pesogi, Lampung, Sumatra”; MZB 3725 “Kabu Peraku, Lampung, Sumatra; NMW 28126:3–4 “Padang, Sumatra”; University of Padang no number: “Western Sumatra”.
- Asthenodipsas vertebralis* (1 specimen): **Malaysia**: ZMB 52072 “Bukit Frazer”.
- Pareas boulengeri* (4 specimens): **China**: MNHN 1912.0349–0351 (**Syntypes** of *Amblycephalus boulengeri*) “Kouy Tcheou”; CIB 10084 “Fangxiang Village, Leishan County, Guizhou Province”.
- Pareas carinatus* (10 specimens): **Indonesia**: RMNH 954 “Java”; SMF 20797 “Buitenzorg, Java; SMF 25995 “Bogor, Java”; SMF 37825–26 “Ranau, Sumatra”; SMF 55295 “Karimundjava, main island, Java Sea” (**Syntypes** of *Amblycephalus carinatus*); ZSM 154/1999 “Gonoung Rinteh, Sultanat Deli, Sumatra”, **Myanmar**: CAS 240362 “Kyaihto Township, Kinpon Chaung Village, Yae Myaung Lay Stream, 17° 24' 21.7" N, 97° 04' 38.6" E”.
- Pareas chinensis* (10 specimens): **China**: CIB 10145 (64I6435), CIB 10147 (64I6667), “Guadun, Chong’an County, Fujian Province”; CIB no number, Shiwan mountain; Shangsi County, Guangxi Province”; FMNH 232812–14 “Sichuan, Hongya Xian: 9 km W Bin Ling, Wa Shan camp”; FMNH 24988–89 “Ch’ungan Hsien, Fujian Province”; ZMB 65431, 27660 “Talifu, Yunnan Province”.
- Pareas formosanus* (8 specimens): **China**: DL 0001 “Jiguan Mt., Szechuan”; **Taiwan**: FMNH 169392 “Yang-Ming-Shan, Taiwan”; FMNH 127998, 169315 “Yang-ming-shan: Yung-foh-lee, Taiwan”; FMNH 169395 “Taiwan, Yang-ming-shan: Mt. Agr. Area”; NMW 28130:1 “Alikang”; NMW 28130:23 “Kosango”; ZMB 30585 “Suisharya”.
- Pareas hamptoni* (5 specimens): **China**: PSGV 1024 “Hainan”; ZMB 65430 “Loshiang, Yao Shan, Guangxi”; **Myanmar**: BM 1904.4.26.16 (**Holotype** of *Amblycephalus hamptoni*) “Mogok, Upper Burma”; **Vietnam**: MNHN 1908.0206 (**Holotype** of *Eberhardtia tonkinensis*) “Lao-Kay”; FMNH 255567 “Nghe An, Tuong Duong Dist: Pu Mat Nature Reserve, wet evergreen forest along Khe Mat stream, 19°03'N 104°37'E, 600m”.
- Pareas macularius* (15 specimens): **China**: CIB 10155 (725035) “Jianfengling Mountain, Hainan. 800m”; **Laos**: MNHN 1994.0743 “Haut Laos”; MNHN 2005.0232 “Long Nai Tai”; **Myanmar**: BM 1946.1.20.8 (**Holotype** of *Pareas macularius*) “Tenasserim”; CAS 206620 “Bago Division: Bago Yoma, 18° 52' 59.8" N, 95° 52' 44.9 E”; CAS 235218 Chin State: Ke Har Stream, Kanpetlet Town, Mindat District, 21° 12' 20.2" N, 94° 03' 01.1" E, 4296 ft; CAS 235359 “Chin State: Old Kanpetlet Township, Mindat District and near Natmataung National Park office, in Tin Nyo house, 21° 12' 16.7" N, 94° 02' 07.9" E, 5937 ft”; CAS 241270 “Kachin State: Mohnyin Township, Indawgyi Wildlife Sanctuary, in the vicinity of Kyang Kyar Village, 25° 18' 12.5" N, 96° 21' 15.0"E, 850 ft”; CAS 245296 “Sagaing Division: Lahe Township, Laung Nguk Village, 26° 09' 22.4"N, 95° 31' 59.8"E, 2721 ft”; CAS 245377 “Sagaing Division: Laung Nguk Village, Lahe Township, 26° 09' 17.8" N, 95° 31' 17.3" E, 2857 ft”; CAS 247899 “Tanintharyi Division: Dawei District, Yaephyu Township, TNR, Khodama military camp, Khodama Stream, 14° 43' 56.9" N, 98° 14' 57.8" E, 260 ft”;

Thailand: FMNH 135331 “Loei Prov, Dansai Dist: Na Phung (vill), Ban Khok (subv), Namlang Mt, 1780m”; **Vietnam:** FMNH 175332 “Ngan-Son”; ZFMK 82925 “Nghe An”; ZFMK 86446 “Quang Binh, Phong Nha Ke Bang NP”.

Pareas margaritophorus (29 specimens): **Cambodia:** FMNH 256973 “Stung Treng Prov, Siem Pang Dist: Virachey National Park, 14°18'52.8"N 106°35'49.9"E, 340m”; NMW 28128:4 “Cambodia”; ZFMK 92636–37, 90378 “Siam Reap, Phnom Kulen NP”; **China:** CIB 10160 (705015) “Yuling, Hainan”; CIB 83792 (665082), CIB 10157–8 (665080–1) “Diaoluo Shan, Hainan”; CIB 10162 (64III5159) “Wuzhi Shan, Hainan”; FMNH 256973 “HongKong”; SMF 20790 “Lo Fou Shan, Kanton” (**Holotype** of *Pareas moellendorffi*); SMF 20791–92 “Hongkong”; ZSM no number “Hong Kong”; **Malaysia:** ZFMK 70584 “Area North of Kuala Lumpur”; **Thailand:** MNHN 0599 (**Holotype** of *Leptognathus margaritophorus*) “Thailande”; ZFMK 76107 “Chiang Mai, Mesa Valley”; **Vietnam:** FMNH 71704–05 “Dalat”; NMW 28129:3, NMW 28128:3 “Tonkin”; NMW 28128:5 “Annam”; NMW 28128:6 “Phuc Son, Annam”; ZFMK 80664 “Quang Binh, Phong Nha Ke Bang NP”; ZFMK 81479 Ha Tinh, ky Anh-Ke Go; ZFMK 82924 Nghe An; ZFMK 95197 “Quang Ninh, Bai Tu Long NP”; ZSM 2271/0 “Tonkin”.

Pareas monticola (3 specimens): **China:** CIB 10163 “Tibet”; **India:** NMW 28127 “Darjeeling”; **Myanmar:** CAS 224415 “Nagmung Township, Hkakabo Razi National Park, between Ngawar Village and Lon Nut Village, 27° 46' 05.5" N, 97° 49' 07.7" E”.

Pareas nuchalis (7 specimens): **Indonesia:** FMNH 131635–36 “Sarawak, 4th Div: Niah”; FMNH 239902–03 “Sabah, Tenom Dist: Crocker Range National Park, Purulon camp, Area I, 5°13'N 115°57'E”; FMNH 269040–41 “Sarawak, Bintulu Div: Bukit Sarang, 2°39'N 113°03'E”; USNM 070863 “Sumatra, Kepahiang”.

Pareas stanleyi (4 specimens): **China:** CIB 10165 “Fujian”; FMNH 24990–92 “Fukien, Ch'ungan Hsien”.

Appendix II: Characters used

Morphometry: Snout-vent length (SVL) in mm, Tail length (TaL) in mm, Total length (TL) in mm, Relative tail length (rel TL) TaL/TL.

Scalation: Dorsal scale rows at neck (at 1 head length behind head)/ at mid-body/ at vent (one head length before vent), Number of keeled dorsal rows, Presence of apical pits, Enlargement of vertebrae, Ventral plates, Number of precentrals, Ventrals notched, keeled or angulated or none of these, Subcaudal plates, Cloacal (anal) plate: 1: single and 2: divided, Number of loreal scales at left/right, Loreal scales touching eye at left/right, Number of supralabials at left/right, Numbers of the supralabials touching the orbit at left/right, Numbers of the supralabials touching subocular at left/right, Largest supralabials left/right, Number of infralabials at left/right, Number of infralabials contacting each other, Number of preoculars at left/right, Number of postoculars at left/right, Subocular fused with postocular, Number of posterior presuboculars at left/right, Number of suboculars at left/right, Number of nasals at left/right, Number of anterior temporals at left/right, Number of posterior temporals at left/right, Prefrontal bordering the eye.

Pattern: Body colour, Number of bands on body, Number of bands on tail, Ornamentation in neck, Presence and number of postocular stripes, Colouration of tail venter, Banding of venter, Speckling of venter.

PLATE 1



Figure 1: Dorsal (above) and ventral (below) views of the holotype (CAS 248147) of *Pareas vindumi* sp. nov.

PLATE 2

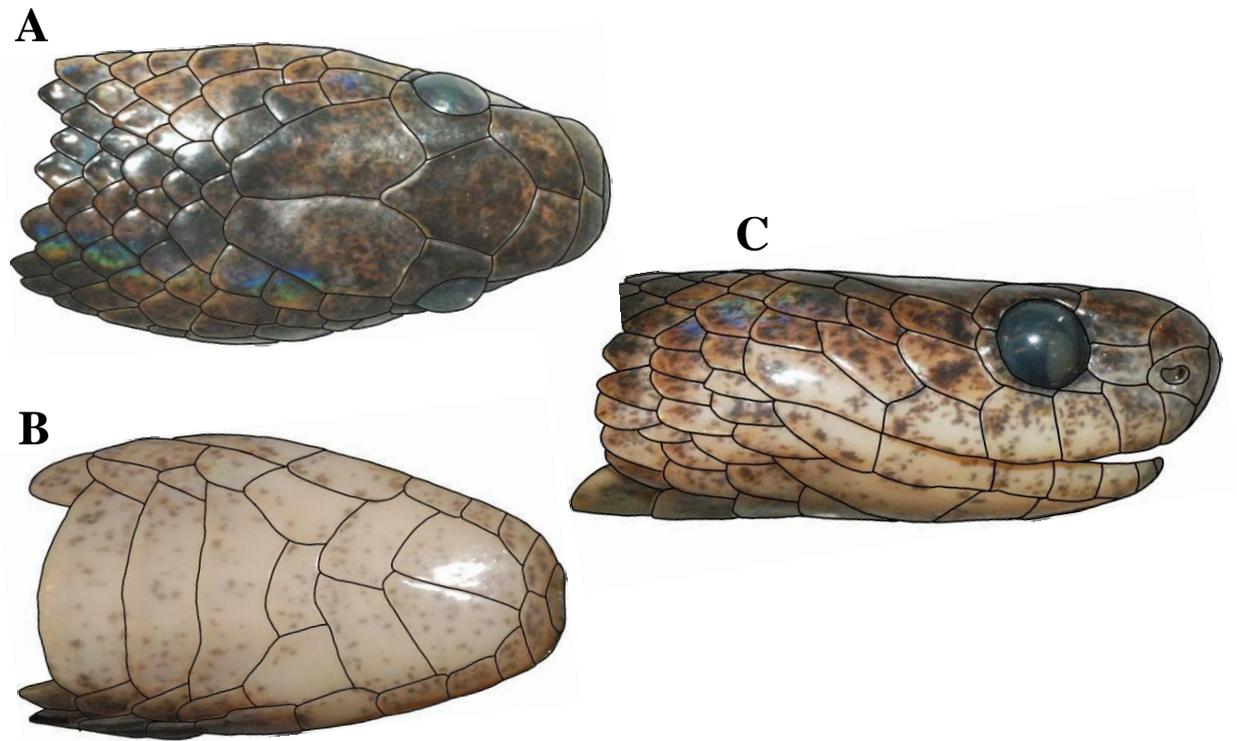


Figure 2: (A) dorsal, (B) ventral, and (C) lateral views of the head of the holotype (CAS 248147) of *Pareas vindumi* sp. nov.



Figure 3: Map indicating the type locality of *Pareas vindumi* sp. nov..

PLATE 3

A



B

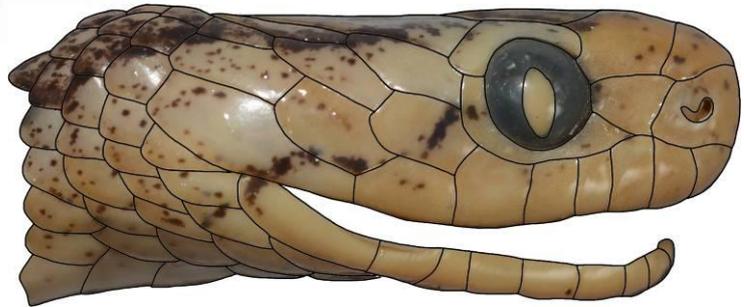


Figure 4: (A) dorsal and (B) lateral views of the head of one of the syntypes (MNHN 1912.0351) of *Pareas boulengeri* (Angel, 1920), China



Figure 5: Live *Pareas monticola*, from Mizoram, India.