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Notes on the genus *Neope* Moore, [1866] from India (Lepidoptera: Nymphalidae, Satyrinae)

G. N. Das, N. Singh & K. Chandra

Abstract

The genus *Neope* Moore, [1866], currently consisting of six species and two additional subspecies from India, is reviewed based on a study of recent materials. A detailed taxonomic treatment of the genus *Neope* from India has been provided along with description of genitalia structures, a gap area for the Indian fauna of *Neope*. The male genitalia as well as external characters of *Neope armandii khasiana* Moore, 1881 is described from India for the first time.

KEY WORDS: Lepidoptera, Nymphalidae, Satyrinae, taxonomy, morphology, genitalia, androconia, *Neope*, India.

Notas sobre el género *Neope* Moore, [1866] de India (Lepidoptera: Nymphalidae, Satyrinae)

Resumen

Se revisa el género *Neope* Moore, [1866], corrientemente formado por seis especies y adicionalmente dos subespecies, basado sobre la revisión de reciente material, de la India. Se proporciona un detallado tratamiento taxonómico del género *Neope* de la India, proporcionando la descripción de la genitalia, para la fauna India de *Neope*. Se describe por primera vez, la genitalia del macho así como los caracteres externos de *Neope armandii khasiana* Moore, 1881 para la India.

PALABRAS CLAVE: Lepidoptera, Nymphalidae, Satyrinae, taxonomía, morfología, genitalia, androconia, *Neope*, India.

Introduction

The genus *Neope* Moore, [1866] was erected for inclusion of two species: *Neope bhadra* (Moore, [1858]) from Darjeeling, and *N. pulaha* (Moore, [1858]) from Bhutan and India. Later on, BUTLER (1868) designated *Lasiommata bhadra* Moore, [1858] as its type species. KIRBY (1877) proposed *Blanaida* as replacement name for *Neope* Moore, due to *Neopus* Hodgson, 1844 as the already existing name in Aves. This assignment was subsequently used by the authors like MOORE (1892) and DE NICÉVILLE (1894). Simultaneously, LEECH (1892) treated *Neope* as a valid generic name. BINGHAM (1905) synonymised *Neope* with *Lethe* Hübner, [1819] along with 11 other genera i.e. *Zophoessa* Doubleday [1849]; *Blanaida* Kirby 1877; *Hanipha* Moore, [1880]; *Rangbia* Moore, [1892]; *Nemetis* Moore, [1892]; *Tansima* Moore, 1881; *Dionana* Moore, [1892]; *Sinchula* Moore, [1892]; *Kerrata* Moore, [1892]; *Putlia* Moore, [1892]; *Patala* Moore, [1892], based on their sex marks and split the genus *Lethe* into three groups. However, FRUHSTORFER (1911) again considered *Neope* as a distinct genus due to the wing venation distinct from typical *Lethe*. EVANS (1932) treated *Neope* as a synonym of *Lethe*, and he divided the genus into three groups namely *Sura*, *Europa* and *Bhadra*. TALBOT ([1949]) followed the same nomenclature, but changed two group names i.e. *Europa* to

Minerva and *Bhadra* to *Yama*. In 1957, DE LESSE revised the genus *Lethe* by including the genital characters of all the members of the genus and raised the Talbot's three groups to three distinct genera as *Blanaida* (= *Neope*), *Zophoessa* and *Lethe*. Later on, MILLER (1968), synonymised *Blanaida* under *Neope* in his revisionary work. Following this, D'ABRERA (1985) documented the genus *Neope* from Oriental region by including most of the recorded Indian species. Subsequently, he also recognized 11 species under this genus from Holarctic region (D'ABRERA, 1990). Furthermore, BOZANO (1999) documented Palaearctic butterfly fauna, and included 13 Chinese species of *Neope* along with their identification key. Recently, LANG (2017) listed a total of 19 species from the China. So far, the genus *Neope* is known by 21 species from the world (LEECH, 1892; LANG, 2017). Among which, only six species of *Neope* are distributed in India with two subspecies (VARSHNEY & SMETACHEK, 2015; LANG, 2017).

In this paper, we briefly reviewed the history of the genus *Neope*, particularly with regard to taxonomy. All taxa of the genus *Neope* from India are briefly described below, with their diagnostic characters and illustrated along with adults and male genitalia of related taxa. The male genitalia as well as external characters of *Neope armandii khasiana* Moore, 1881 is described from India for the first time. We studied the structure of sex brands on forewing as well as morphological characteristics of androconia scales, which are described in this study for the first time for Indian species, with their taxonomic importance.

Materials and methods

Studied specimens were collected by sweeping net from various localities of India Himalayan states. Collected specimens were processed as per standard techniques in lepidopterology. Adults were photographed using a Nikon 7000D digital SLR camera. The detailed microscopic photography was performed under Leica M205 C stereomicroscope with a Leica Application Suite, after removing extraneous abdominal tissue with 20% KOH. The sex scales (androconia) were removed from the upperside of the forewings in males and observed under Nikon microscope at 400x magnifications, and for measurement follows the work of WAKEHAM-DAWSON & KUDRNA (2000).

Taxonomic accounts

Family Nymphalidae Rafinesque, 1815
Subfamily Satyrinae Boisduval, 1833
Tribe Satyrini Boisduval, 1833
Subtribe Lethina Reuter, 1896
Genus *Neope* Moore, [1866]

Neope Moore, [1866]. *Proc. zool. Soc. Lond.*, **1865**(3): 770.

Type Species: *Lasiommata bhadra* Moore, [1858].

Diagnosis: The genus *Neope* can be distinguished from its close relatives *Lethe* due to presence of an ocellus in space 7 on underside of the hindwing, which is absence in *Lethe*. In *Neope* the vein 8 is nearly as long as vein 7, whereas in *Lethe* it is half of vein 7.

Neope bhadra (Moore, [1858]) (Figures 1, 2, 13, 19, 25, 31, 34a)

Lasiommata? bhadra Moore, [1858], in Horsfield & Moore. *Catal. Lep. Mus. E. I. C.*, (1): 227 (Type Locality: Darjeeling); Butler, 1867. *Ann. Mag. nat. Hist.*, **19**(3): 166.

Neope bhadra: Moore, 1865. *Proc. zool. Soc. Lond.*, **1865**: 770; de Nicéville, 1882. *J. Asiatic Soc. Bengal*, **51**(2): 56; Marshall & de Nicéville, 1883. *Butt. Ind.*, **1**: 171; Staudinger, 1888. *Exot. Schmett.*: 222; Elwes, 1891. *Proc. zool. Soc. Lond.*, **1891**: 265; Fruhstorfer, 1911, in Seitz. *Macrolepid. World*, **9**:

325; D'Abrera, 1985. *Butt. Orient.*, **2**: 432; Smith, 1989. *Butt. Nepal*, **1989**: 266; Lang, 2017. *Nymphalidae of China*, **II**: 27.

Blanaida bhadra: Moore, 1892. *Lep. Ind.* **1**: 300; de Nicéville, 1894. *Sikk. Gaz.*, **1894**: 126.

Lethe bhadra: Bingham, 1905. *Fauna Br. Ind., Butt.*, **1**: 101; Evans, 1932. *Iden. Ind. Butt.*: 109; Talbot, [1949]. *Fauna Br. India, Butt.*, **2**: 236; Mani, 1986. *Butt. Himalaya* **1986**: 88.

Lethe b[h]adra: Wynter-Blyth, 1957. *Butt. Ind. Region*, **1957**: 102.

Neope bhadra subflava Zhou, 1994, in Chou. *Monograph. Rhop. Sin.*: 756 (Type Locality: Mt. Dayaoshan, Guangxi, China)

Neope bhadra endohi Funahashi, 2003. *Wallace*, **8**: 11 (Type Locality: Sa Pa, Lao Cai, N Vietnam).

Materials examined: INDIA, Arunachal Pradesh, Changlang, Namdapha, 27th mile, 370 m, 1 ♂, 27-X-2016, Coll. J. Saini & Party; Arunachal Pradesh, Changlang, Namdapha, Hornbill, 457 m, 1 ♂, 05-XI-2016, Coll. J. Saini & Party.

Diagnosis (Figs. 1-2): *Neope bhadra* is closely similar to *N. armandii* (Oberthür 1876) but it can be distinguished by the presence of large caudate at vein 4 of hindwing. *Neope bhadra* having two prominent bars in the cell on the upperside of forewing (in *N. armandii* a single bar before end of cell is present) and have a small ocellus in space 1a on underside of hindwing (absent in *N. armandii*).

Male genitalia (Fig. 13): Tegumen broad and stout; uncus long (1.75 mm), smoothly curved with gradually narrowed tip; gnathos long and slender; valva long and broader at base with an apical spine (Fig. 19); saccus moderately long (1.45 mm); aedeagus typically straight and about 2.86 mm long with smooth surface (Fig. 25).

Androconia (Fig. 31): Common in shape like other Satyrini, comparatively long and slender lamina average 233.8 µm long and gradually narrowed towards apex with an apical plume and the base is bulbous with average values of 18.8 µm.

Distribution: E Nepal, Bhutan, India (Sikkim to NE India), S China, N Myanmar, Thailand, Laos and Vietnam (SMITH, 1989; VARSHNEY & SMETACHEK, 2015; LANG, 2017; INAYOSHI, 2020).

Comments: According to WAKEHAM-DAWSON & KUDRNA (2000) "Androconia appear to be relatively consistent in overall size and shape within species". This attribute is also used as a key character for the differentiation of species and subspecies in butterflies. Interestingly, in the studied sample, androconia length varied from 216 to 264 µm within the single specimen. So, further studies on the androconia will definitely help in solving this ambiguity.

Neope armandii (Oberthür, 1876)

Satyrys armandii Oberthür, 1876. *Étud. ént.*, **2**: 26 (Type Locality: "Mou-pin").

Neope armandii khasiana Moore, 1881 (Figures 3, 4, 14, 20, 26, 32, 34b)

Neope khasiana Moore, 1881. *Trans. ent. Soc. Lond.*, **1881**(3): 306 (Type Locality: "Khasia Hills"); Marshall & de Nicéville, 1883. *Butt. Ind.*, **1**: 172.

Blanaida khasiana: Moore, 1892. *Lep. Ind.*, **1**: 302; Tytler, 1914. *J. Bombay nat. Hist. Soc.*, **23**(2): 222.

Lethe bhadra f. khasiana: Bingham, 1905. *Fauna Br. Ind., Butt.*, **1**: 102.

Lethe khasiana: Tytler, 1911. *J. Bombay nat. Hist. Soc.*, **21**(1): 53.

Neope bhadra khasiana: Fruhstorfer, 1911, in Seitz. *Macrolepid. World*, **9**: 325.

Lethe armandii khasiana: Evans, 1932. *Iden. Ind. Butt.*: 109; Talbot, [1949]. *Fauna Br. India, Butt.*, **2**: 235.

Lethe armandii: Wynter-Blyth, 1957. *Butt. Ind. Region*, **1957**: 102.

Neope armandii: D'Abrera, 1985. *Butt. Orient.*, **2**: 432; D'Abrera, 1990. *Butt. Holarc.*, **1**: 134; Bozano, 1999. *Guide Butt. Pal. Reg., Satyridae*, **1**: 29.

Neope armandii khasiana: Huang, 2003. *Neue Ent. Nachr.*, **55**: 96; Lang, 2017. *Nymphalidae of China*, **II**: 27; Lang & Tshikolovets, 2020. *Entomol. Z.*, **130**(2): 95.

Material examined: INDIA, Arunachal Pradesh, Dibang Valley, Etabe, Embronamu, 1700 m, 1 ♂, 17-V-2018, Coll. Gayen & Party.

Diagnosis (Figs. 3-4): *Neope armandii* is closely similar to *N. bhadra*, and the diagnostic characters have been discussed under *N. bhadra*. Among four subspecies of *N. armandii*, *N. a. khasiana* is distinct due to a yellowish bar before end of cell, which is pale yellow in *N. a. koikei* Funahashi, 2003 (Vietnam, Laos and N Thailand), whitish in *N. a. huanghaoi* Lang & Tshikolovets, 2020 (S China) and obsolete in nominate subspecies. Apical half of upperside of the forewing is having pure white spots in *N. a. khasiana*, *N. a. koikei* and *N. a. huanghaoi*, whereas all spots are yellowish in nominate subspecies. On underside, the distal half of hindwing is yellowish in *N. a. khasiana* as in *N. a. armandii* and *N. a. koikei* whereas in *N. a. huanghaoi* it is white.

Male genitalia (Fig. 14): Tegumen broad and stout; uncus broad and long (1.93 mm), with suddenly narrowed apex; gnathos straight and half long of uncus, with swelling base; valva long with a short apical spine (Fig. 20); saccus moderately long (1.36 mm); aedeagus slightly curved, 2.81 mm long and without any dentation (Fig. 26).

Androconia (Fig. 32): Normal in shape, elongated lamina average 233.4 μ m long with plume like apex and more bulbous base than previous one with average values of 25.2 μ m.

Distribution: NE India and N Myanmar (VARSHNEY & SMETACHEK, 2015; LANG & TSHIKOLOVETS, 2020).

Comments: According to LANG & TSHIKOLOVETS (2020) the subspecies classification of *N. armandii* is still uncertain due to crypticism, and considered that the Indo-Chinese subspecies *N. a. koikei* is possibly a junior synonym of *N. a. khasiana*. The current study also shows that *N. a. koikei* has no obvious difference from *N. a. khasiana*, except some minor differences. But, as in the previous species, the androconia length varied from 192 to 274 μ m in the studied sample. Thus, further study on populations is needed to clarify its status.

Neope pulaha (Moore, [1858]) (Figures 5, 6, 15, 21, 27, 33, 34c)

Lasiommata? pulaha Moore, [1858], in Horsfield & Moore. *Catal. Lep. Mus., E. I. C.*, (1): 227 (Type Locality: "Bootan"); Butler, 1867. *Ann. Mag. nat. Hist.*, **19**(3): 166.

Enope pulaha: Moore, 1865. *Proc. zool. Soc. Lond.*, **1865**(3): 499.

Neope pulaha: Moore, 1865. *Proc. zool. Soc. Lond.*, **1865**(3): 770; Marshall & de Nicéville, 1883, *Butt. Ind.*, **1**: 170.

Blanida pulaha: Moore, 1892. *Lep. Ind.*, **1**: 303; de Nicéville, 1894. *Sikk. Gaz.*, **1894**: 126.

Lethe pulaha: Bingham, 1905. *Fauna Br. Ind.*, *Butt.* **1**: 102; Wynter-Blyth, 1957. *Butt. Ind. Region*, **1957**: 101.

Neope pulaha pulaha: Fruhstorfer, 1911, in Seitz. *Macrolepid. World*, **9**: 325; D'Abrera, 1985. *Butt. Orient.*, **2**: 434; Smith, 1989. *Butt. Nepal*, **1989**: 210; Huang, 2002. *Atalanta*, **33**(3/4): 362; Huang, 2003. *Neue Ent. Nachr.*, **55**: 96; Lang, 2017. *Nymphalidae of China*, **II**: 35; Sondhi & Kunte, 2018. *Butt. Uttarakhand*: 217.

Neope pulata f. *stigmata* Mell, 1923. *Dt. ent. Z.*, **1923**: 156 (Type Locality: N. Kwangtung).

Lethe pulaha pulaha: Evans, 1932. *Iden. Ind. Butt.*: 109; Talbot, [1949]. *Fauna Br. India Butt.*, **2**: 232; Mani, 1986. *Butt. Himalaya*, **1986**: 88.

Nepoe [*Neope*] *pulaha pulaha*: Fujioka, 1970. *Spec. Bull. Lepidopt. Soc. Japan*, **4**: 48.

Neope pulahoides xizangana Wang, 1994, in Chou. *Monogr. Rhop. Sin.*: 756 (Type Locality: Linzhi, Xizang).

Neope pulaha pulahoides: Masui & Uehara, 1999. *Gekkan-Mushi*, **338**: 19; Osada, Uémura & Uehara, 1999. *Ill. Checklist Butt. Laos P. D. R.*: 210; Uémura, 2004. *Bull. Toyosato Mus. Ent.*, (**13**): 1; Nakamura & Wakahara, 2012. *Evol. Sci.*, **17**: 48.

Materials examined: INDIA, Arunachal Pradesh, Dibang Valley, Kahi Nalah, 1768 m, 1 ♂, 07-IV-2017, Coll. Gayen & Das; Arunachal Pradesh, Dibang Valley, Anini-Mippi road, 1667 m, 1 ♂, 13-IV-2017, Coll. Gayen & Das; Arunachal Pradesh, Dibang Valley, Basam, 1714 m, 2 ♂♂, 17-18-IV-2018, Coll. Ranjan & Das.

Diagnosis (Figs. 5-6): *Neope pulaha* is closely similar to *N. pulahoides*, but is distinct due to two weakly separated transvers male brands at space 1b on the upperside of forewing (absent in *N. pulahoides*) and on the underside of forewing, ocelli present in space 2 and 3 are blind, whereas in *N. pulahoides* ocelli are with a tiny white pupil. The nominate subspecies *N. pulaha pulaha* is closely similar to *N. pulaha pandyia*, but can be distinguished from *N. pulaha pandyia* by having a distinct end cell bar across the cell in both the seasonal forms. Furthermore, *N. pulaha pulaha* is distinct from other two subspecies *N. pulaha emeinsis* Li, 1995 (S China) and *N. pulaha didia* Fruhstorfer, 1909 (Taiwan) in having yellowish marking on both the surfaces of forewing which is whitish in *N. pulaha emeinsis* and in *N. pulaha didia* with much more reduced yellow spots on upper surface.

Male genitalia (Fig. 15): Closely similar to *N. pulahoides*. Tegumen relatively broad with strong vinculum; uncus broad and long (1.1 mm) with suddenly narrowed apex; gnathos gently curved and long; valva long with a needle like apical spine (Fig. 21); saccus about length of uncus (0.93 mm); aedeagus slightly curved, 1.83 mm long with a patch of small teeth near the laterocaudal end on both sides (Fig. 27).

Androconia (Fig. 33): Normal in shape and relatively shorter than previous two species, lamina average 202.2 µm long with stocky plume at apex and bulbous base with average values of 20.9 µm.

Distribution: C Nepal to NE India, N Myanmar, SE Tibet, W Yunnan, Laos and Vietnam (SMITH, 1989; VARSHNEY & SMETACHEK, 2015; LANG, 2017; INAYOSHI, 2020).

Neope pulaha pandyia (Talbot, [1949]) (Figure 34d)

Lethe pulaha pandyia Talbot, [1949]. *Fauna Br. India Butt.*, **2**: 232 (Type Locality: "North-Western Himalayas"); Mani, 1986. *Butt. Himalaya*, **1986**: 88.

Blanaida pulaha: MacKinnon & de Nicéville, 1897. *J. Bombay nat. Hist. Soc.*, **11**: 216.

Lethe (Neope) pulaha: Doherty, 1886. *J. Asiatic Soc. Bengal*, **55**(2): 117; Hannyngton, 1910. *J. Bombay nat. Hist. Soc.*, **20**(1): 135.

Lethe pulaha pulaha: Wynter-Blyth, 1940. *J. Bombay nat. Hist. Soc.*, **41**(4): 724.

Neope pulaha pandyia: Huang, 2002. *Atalanta*, **33**(3/4): 362; Huang, 2003. *Neue Ent. Nachr.*, **55**: 96; Singh & Sondhi, 2016. *JoTT* **8**(4): 8689; Sondhi & Kunte, 2018. *Butt. Uttarakhand*: 217.

Materials examined: Not examined.

Diagnosis: *Neope pulaha pandyia* is closely similar to the nominate subspecies, but can be distinguished from *N. p. pulaha* by smaller in size. In wet seasonal form, the distinct end cell bar is absent in *N. p. pandyia* whereas, it is present in both the seasonal forms of *N. p. pulaha*. In dry seasonal form, *N. p. pandyia* is more ochraceous, especially the females, in compare to nominate subspecies.

Distribution: W Nepal and N India (Himachal Pradesh and Uttarakhand) (SMITH, 1989; SONDHI & KUNTE, 2018).

Neope pulahoides Moore, 1892 (Figures 7, 8, 16, 22, 28, 34e)

Blanaida pulahoides Moore, 1892. *Lep. Ind.*, **1**: 304 (Type Locality: "Naga Hills; E. Pegu").

Lethe pulaha race. *pulahoides*: Bingham, 1905. *Fauna Br. Ind., Butt.*, **1**: 102.

Neope pulaha pulahoides: Fruhstorfer, 1911, in Seitz. *Macrolepid. World*, **9**: 325; Sondhi & Kunte, 2018. *Butt. Uttarakhand*: 217.

Lethe pulaha: Evans, 1932. *Iden. Ind. Butt.*: 109; Talbot, [1949]. *Fauna Br. India, Butt.*, **2**: 233.

Neope pulahoides pulahoides: Huang, 2001. *Neue Ent. Nachr.*, **51**: 107; Huang, 2002. *Atalanta*, **33**(3/4): 362; Huang, 2003. *Neue Ent. Nachr.*, **55**: 96; Lang, 2017. *Nymphalidae of China*, **II**: 37.

Neope chayuiensis Huang, 2002. *Atalanta* **33**(3/4): 363 (Type Locality: "Tiyu, Chayu, S.E. Tibet"); Huang, 2003. *Neue Ent. Nachr.* **55**: 96.

Material examined: INDIA, Arunachal Pradesh, Dibang Valley, Anini-Mippi road, 1667 m, 1 ♂, 03-V-2017, Coll. Gayen & Das.

Diagnosis (Figs. 7-8): *Neope pulahoides* is diagnosed due to absence of male brands on upperside

of forewing, which are present in *N. pulaha* and other similar species. On the underside of forewing, ocelli in space 2 and 3 are with tiny white pupil whereas, in *N. pulaha* it is blind. On the upperside of forewing, the nominate subspecies has a broader bar before end of cell in compare to other subspecies: *N. pulahoides leechi* Okano & Okano, 1984 (S China), *N. pulahoides tamur* Fujioka, 1970 (E Nepal) and *N. pulahoides chuni* Mell, 1942 (Fujian).

Male genitalia (Fig. 16): Closely similar to *N. pulaha*. Tegumen normal shaped with strong vinculum; uncus broader and long (1.27 mm), with suddenly narrowed apex; gnathos gently curved and almost length of uncus; valva moderately long with a very short apical spine (Fig. 22); saccus 2/3 to length of uncus (0.92 mm); aedeagus slightly curved, about 1.94 mm long with smooth surface (Fig. 28).

Androconia: No sex brand present.

Distribution: NE India, SE Tibet, NW Yunnan, Myanmar and Thailand (VARSHNEY & SMETACHEK, 2015; LANG, 2017; INAYOSHI, 2020).

Neope pulahina (Evans, 1923) (Figures 9, 10, 17, 23, 29, 34f)

Lethe pulahina Evans, 1923. *J. Bombay nat. Hist. Soc.*, **29** (2): 536 (Type locality: "Sikkim to Manipur"); Evans, 1932. *Iden. Ind. Butt.*: 109; Talbot, [1949]. *Fauna Br. India, Butt.*, **2**: 234; Wynter-Blyth, 1957. *Butt. Ind. Region*, **1957**: 101; Mani, 1986. *Butt. Himalaya*, **1986**: 88.

Neope pulahina: Fujioka, 1970. *Spec. Bull. Lep. Soc. Jap.*, **4**: 48; D'Abrera, 1985. *Butt. Orient.*, **2**: 434; Smith, 1989. *Butt. Nepal*, **1989**: 210; Huang, 2003. *Neue Ent. Nachr.*, **55**: 96; Lang, 2017. *Nymphalidae of China*, **II**: 37.

Material examined: CHINA, Yunnan, Gongshan, 2500 m, 1 ♂, 14-VI-2014, leg. Hao Huang.

Diagnosis (Figs. 9-10): *Neope pulahina* is distinct from its close relatives, *N. pulaha*, *N. pulahoides*, *N. ramosa* Leech, 1890 (S China) in having more reddish brown ground colour on the upper surface, and the under surface of hindwing is strongly irrorated with purple scales. *Neope pulahina* is having two weakly separated male brands at space 1b as in *N. pulaha*, but in *N. pulahina* all spots are reddish yellow on the upper surface (more yellowish in *N. pulaha*). On underside of forewing, *N. pulahina* is having white pupiled ocelli in space 2 and 3 as in *N. pulahoides*, but it is distinct from latter due to reddish yellow spots present on the distal half of forewing (whitish in *N. pulahoides*).

Male genitalia (Fig. 17): Closely similar to *N. pulaha*. Tegumen broad; uncus slender and long (1.42 mm), with suddenly narrowed and more pointed apex; gnathos are gently curved and almost half length of uncus; valva comparatively long with an elongated, sharply pointed apical spine (Fig. 23); saccus rather short (0.84 mm); aedeagus straight (1.75 mm) and surface smooth (Fig. 29).

Androconia: Not examined.

Distribution: C Nepal to NE India, N Myanmar, SE Tibet and NW Yunnan (SMITH, 1989; VARSHNEY & SMETACHEK, 2015; LANG, 2017).

Neope yama (Moore, [1858]) (Figures 11, 12, 18, 24, 30, 34g)

Zophoessa yama Moore, [1858], in Horsfield & Moore. *Catal. Lep. Mus., E. I. C.*, (1): 221 (Type Locality: "Bootan, N. India"); Marshall & de Nicéville, 1883. *Butt. Ind.*, **1**: 169.

Patala yama: Moore, 1892. *Lep. Ind.*, **1**: 306; Smith, 1989. *Butt. Nepal*, **1989**: 211.

Patala yamoides: Moore, 1892. *Lep. Ind.*, **1**: 307; de Nicéville, 1894. *Sikk. Gaz.*, **1894**: 126.

Lethe yama: Bingham, 1905. *Fauna Br. Ind., Butt.*, **1**: 103; Wynter-Blyth, 1957. *Butt. Ind. Region*, **1957**: 102; Mani, 1986. *Butt. Himalaya*, **1986**: 88.

Neope yama yama: Fruhstorfer, 1911, in Seitz. *Macrolepid. World*, **9**: 325; Fujioka, 1970. *Spec. Bull. Lep. Soc. Jap.*, **4**: 48; D'Abrera, 1985. *Butt. Orient.*, **2**: 432; Lang, 2017. *Nymphalidae of China*, **II**: 38; Sondhi & Kunte, 2018. *Butt. Uttarakhand*: 218.

Neope yama yamoides: Fruhstorfer, 1911, in Seitz. *Macrolepid. World*, **9**: 325.

Lethe yama yama: Evans, 1932. *Iden. Ind. Butt.*: 110; Talbot, [1949]. *Fauna Br. India, Butt.* **2**: 232.

Lethe yama yamoides: Evans, 1932. *Iden. Ind. Butt.*: 110.

Neope yama: Monastyrskii, 2005. *Atalanta*, **36**(1/2): 147.

Material examined: CHINA, Yunnan, Gongshan, East slope of Mts. Gao-li-gong, 1 ♂, 20-VI-2015, leg. Song-yun Lang.

Diagnosis (Figs. 11-12): *Neope yama* is morphologically similar to *N. serica* Leech, 1892 (SE China), but *N. yama* have dark brown ground colour on upperside whereas, in *N. serica* it is more blackish. In *N. yama*, the post discal band on underside of forewing is almost straight which is distorted in *N. serica*. The nominate subspecies *N. yama yama*, can be distinguished from its close relatives *N. y. buckleyi* in having dark brown on both the surface of both wings and a broad prominent post discal band on upperside of forewing, whereas in *N. yama buckleyi*, ground colour is paler and post discal band is narrower and posteriorly diffused. Its other two subspecies, *N. yama uemurai* Sugiyama, 1994 (C China) and *N. yama kinpingensis* Lee, 1962 (S China, N Vietnam and Laos) are darker in ground colour on both surface (even darker than *N. yama yama*).

Male genitalia (Fig. 18): Tegumen broad; uncus long (1.53 mm), slender, and apically blunt in dorsal view; gnathos gently curved and almost 2/3 length of uncus; valva moderately long with an elongated, sharply pointed apical spine (Fig. 24); saccus rather short (0.98 mm); aedeagus short (1.57 mm) and strongly bent (Fig. 30).

Androconia: Not examined.

Distribution: E Nepal to NE India, SE Tibet, N Myanmar and N Thailand (SMITH, 1989; LANG, 2017; SONDHI & KUNTE, 2018; INAYOSHI, 2020).

Neope yama buckleyi Talbot, [1949] (Figure 34h)

Lethe yama buckleyi Talbot, [1949]. *Fauna Br. India, Butt.*, **2**: 239 (Type Locality: "Kulu to Nepal").

Patala yama: MacKinnon & de Nicéville, 1897. *J. Bombay nat. Hist. Soc.*, **11**: 216.

Lethe (Zophoessa) yama: Hannynghton, 1910. *J. Bombay nat. Hist. Soc.*, **20**(1): 135.

Neope yama buckleyi: Singh & Sondhi, 2016. *JoTT*, **8**(4): 8689; Sondhi & Kunte, 2018. *Butt. Uttarakhand*: 218.

Material examined: Not examined.

Diagnosis: *Neope yama buckleyi* can be distinguished from the nominate subspecies by smaller in size and paler in colour. On the underside of forewing, *N. y. buckleyi* is having a narrower and posteriorly diffused post discal band in compare to other three subspecies: *N. y. yama*, *N. y. kinpingensis* and *N. y. uemurai*. On the underside of hindwing, *N. y. buckleyi* is without any dark shading towards tornus which is presents in other subspecies.

Distribution: W Nepal and N India (Himachal Pradesh and Uttarakhand); (SMITH, 1989; SONDHI & KUNTE, 2018).

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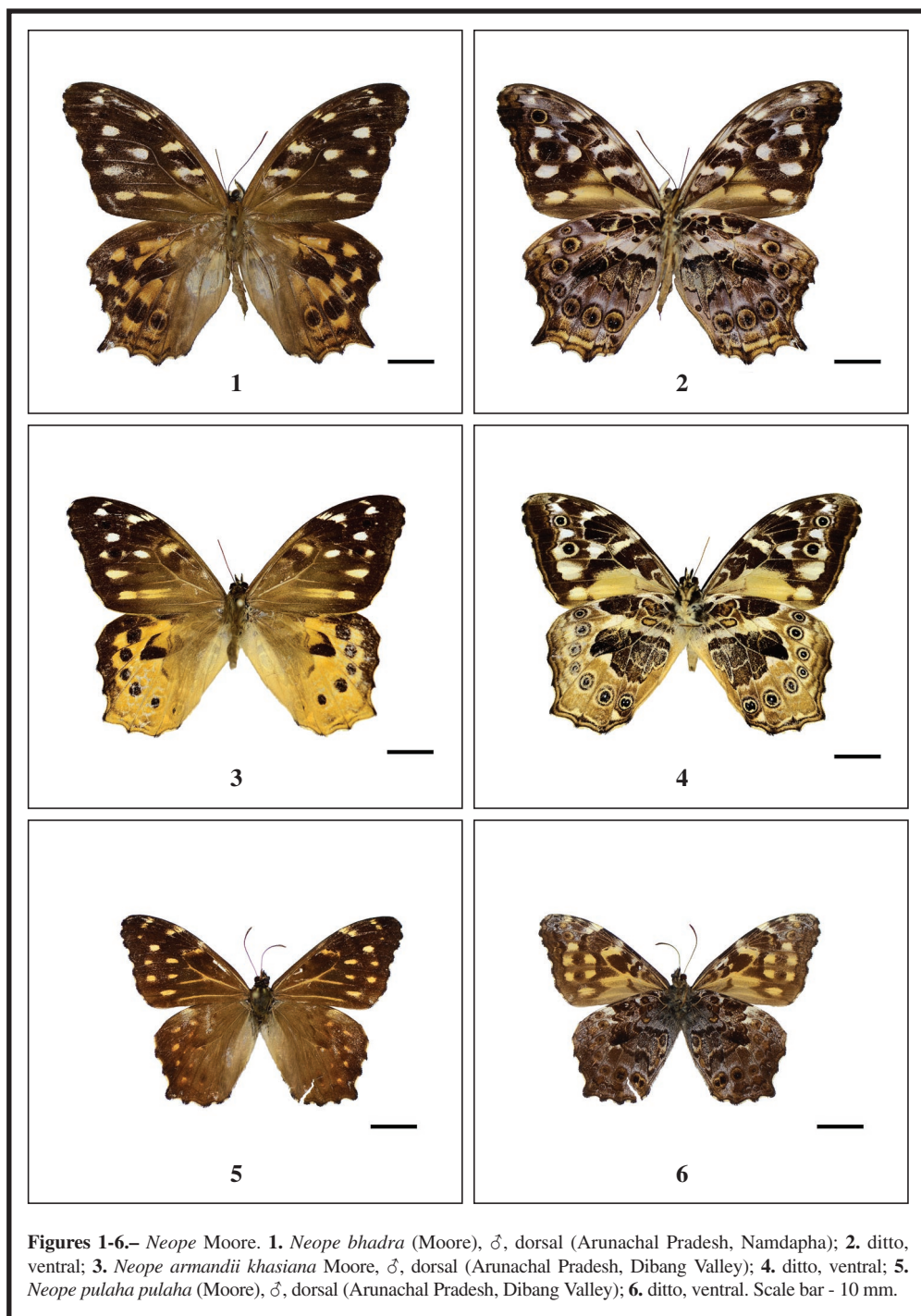
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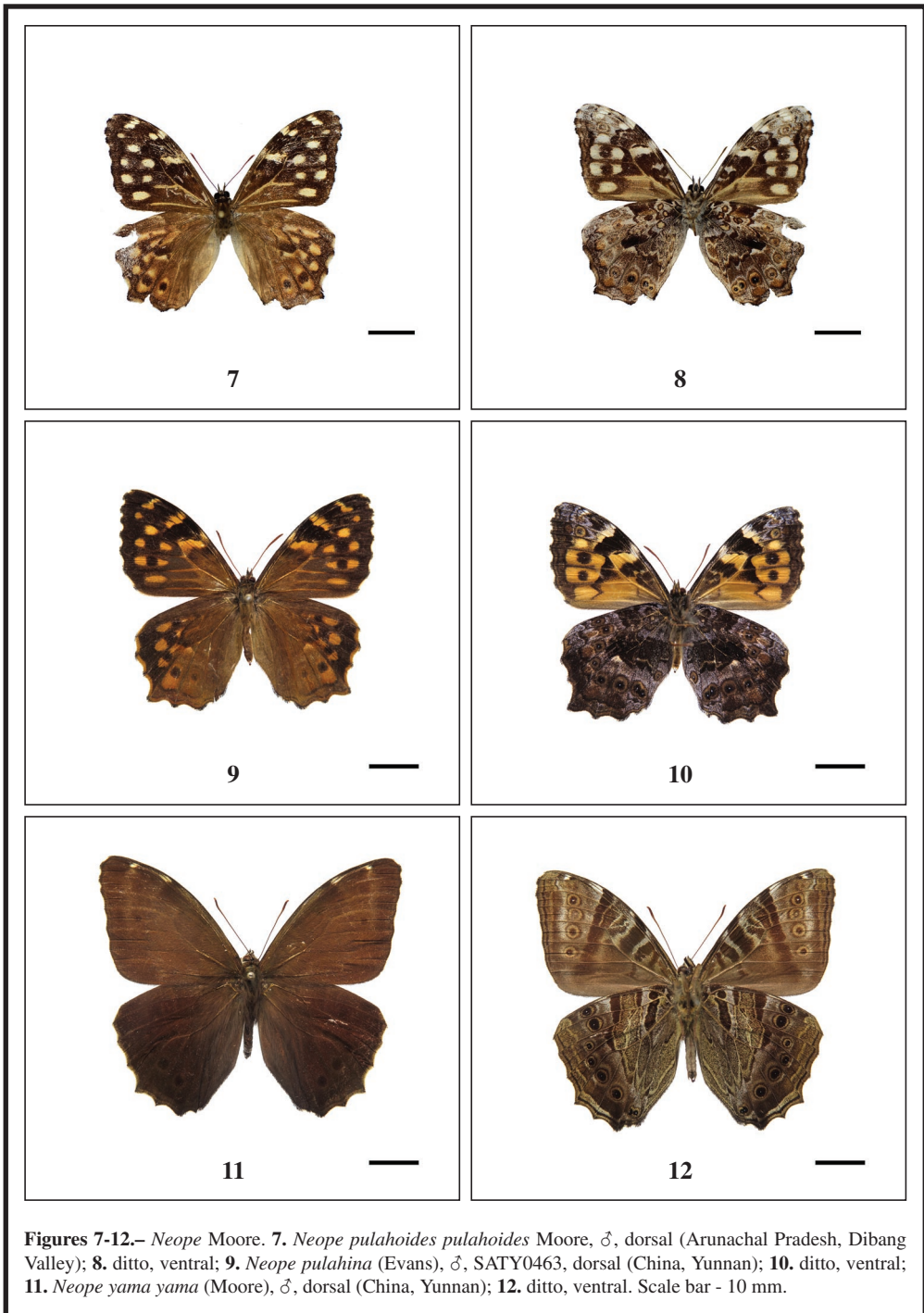
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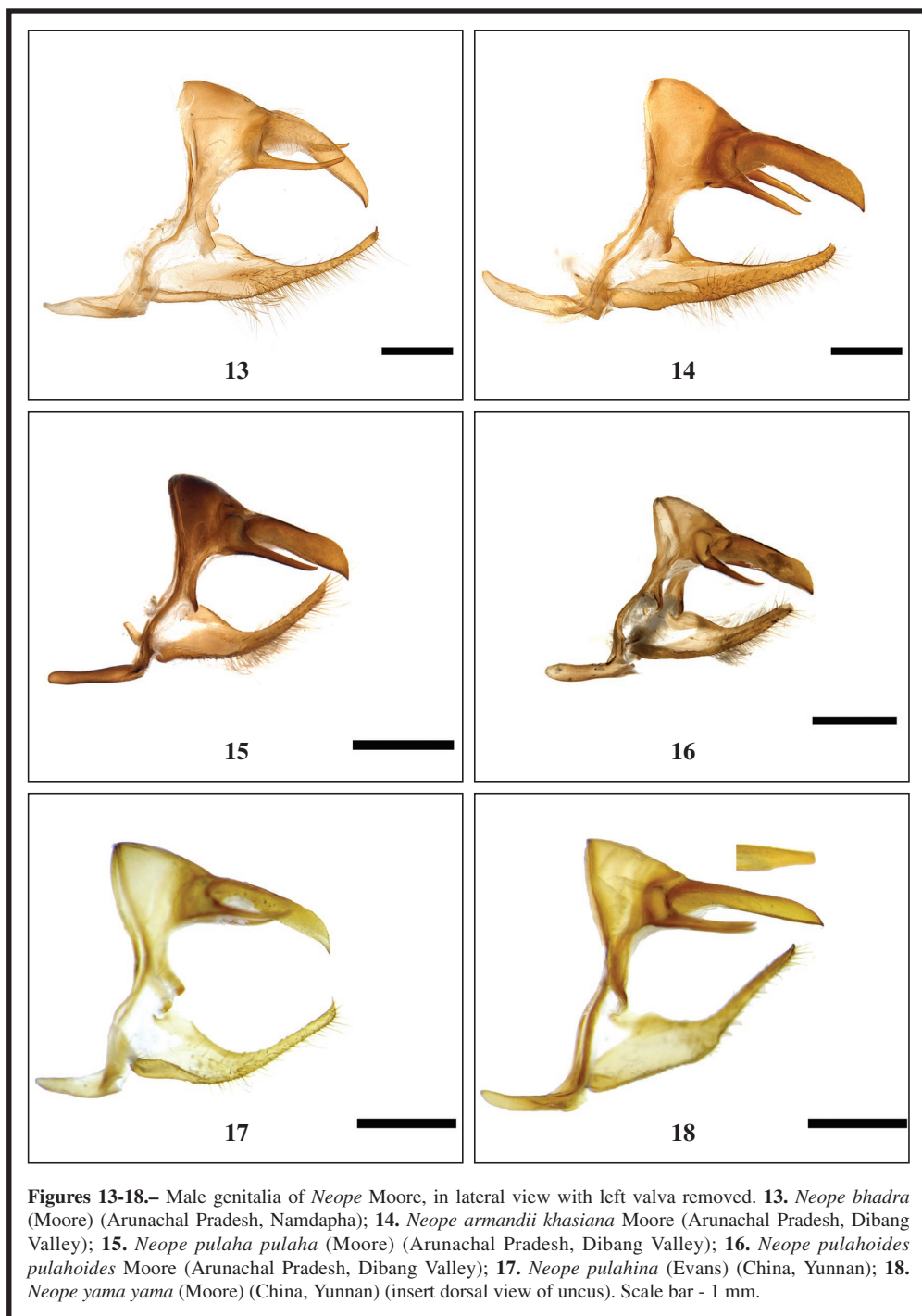
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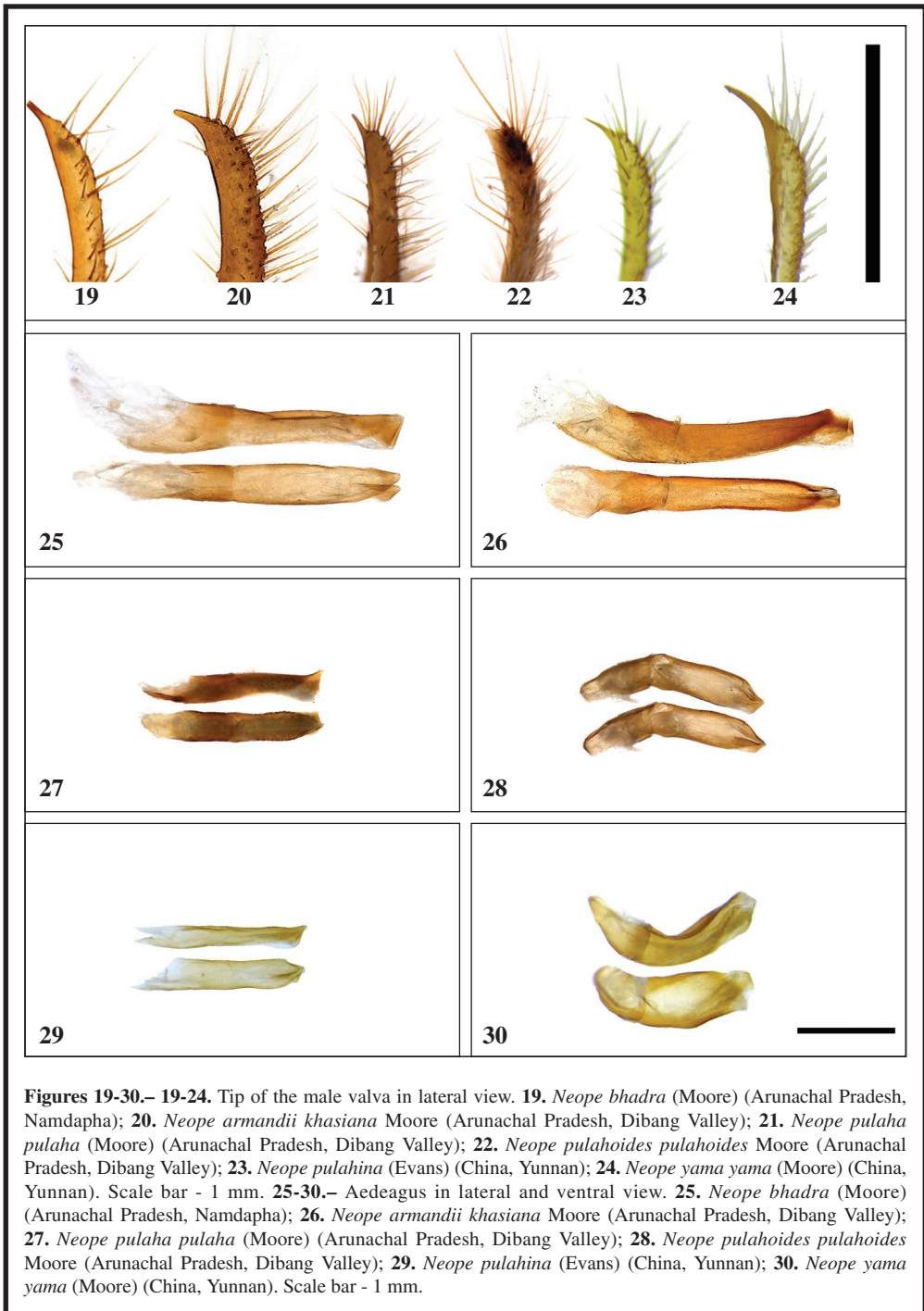




Figures 7-12.– *Neope* Moore. **7.** *Neope pulahoides pulahoides* Moore, ♂, dorsal (Arunachal Pradesh, Dibang Valley); **8.** ditto, ventral; **9.** *Neope pulahina* (Evans), ♂, SATY0463, dorsal (China, Yunnan); **10.** ditto, ventral; **11.** *Neope yama yama* (Moore), ♂, dorsal (China, Yunnan); **12.** ditto, ventral. Scale bar - 10 mm.



Figures 13-18.– Male genitalia of *Neope* Moore, in lateral view with left valva removed. **13.** *Neope bhadra* (Moore) (Arunachal Pradesh, Namdapha); **14.** *Neope arandii khasiana* Moore (Arunachal Pradesh, Dibang Valley); **15.** *Neope pulaha pulaha* (Moore) (Arunachal Pradesh, Dibang Valley); **16.** *Neope pulahoides pulahoides* Moore (Arunachal Pradesh, Dibang Valley); **17.** *Neope pulahina* (Evans) (China, Yunnan); **18.** *Neope yama yama* (Moore) (China, Yunnan) (insert dorsal view of uncus). Scale bar - 1 mm.





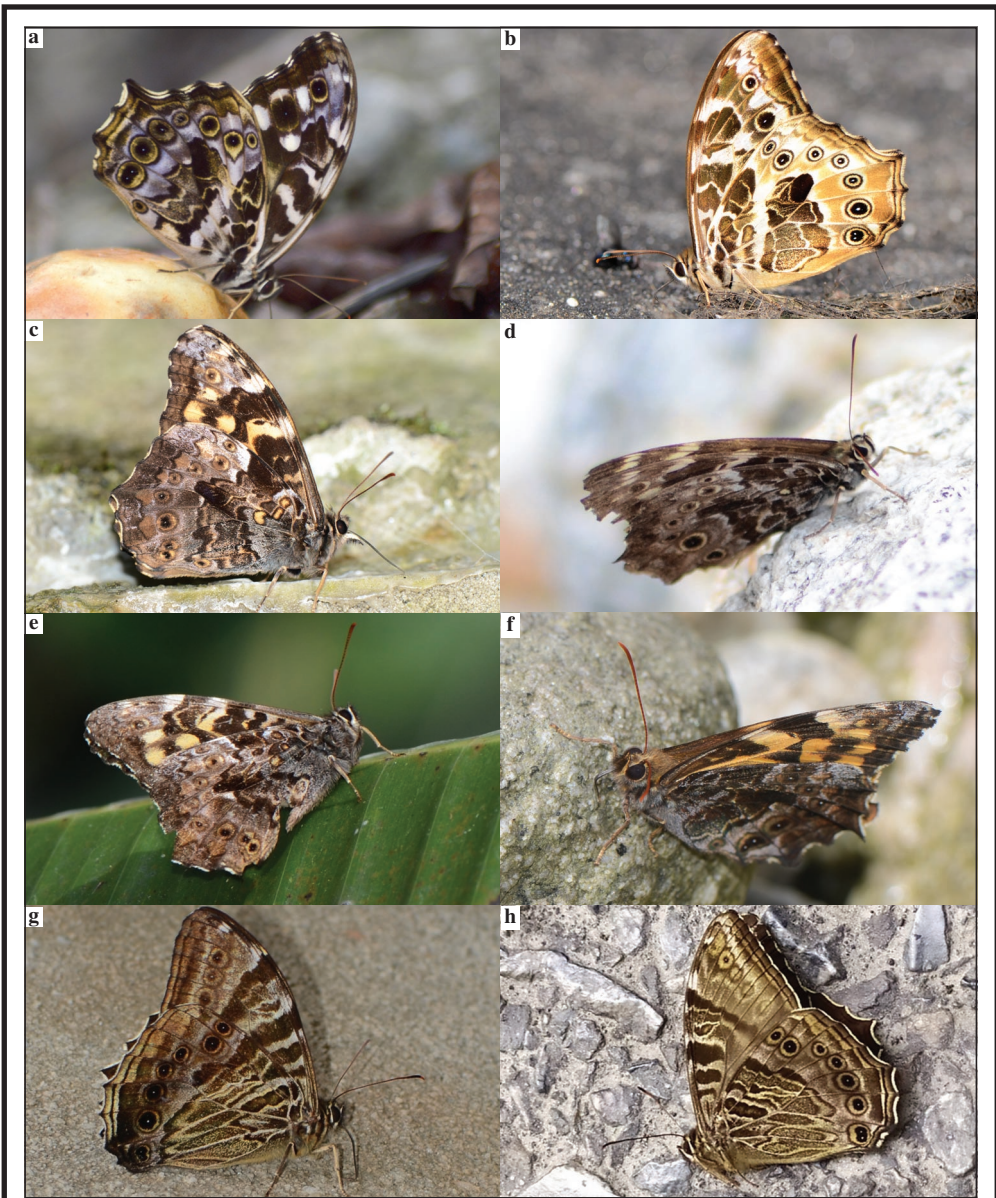


Figure 34.– *Neope* Moore of India. **a.** *Neope bhadra* (Moore) (Arunachal Pradesh, Namdapha); **b.** *Neope arandii khasiana* Moore (Arunachal Pradesh, Dibang Valley); **c.** *Neope pulaha pulaha* (Moore) (Arunachal Pradesh, Dibang Valley); **d.** *Neope pulaha pandya* (Talbot) (Himachal Pradesh, Kullu); **e.** *Neope pulahoides pulahoides* Moore (Arunachal Pradesh, Dibang Valley); **f.** *Neope pulahina* (Evans) (Arunachal Pradesh, Dibang Valley); **g.** *Neope yama yama* (Moore) (Arunachal Pradesh, Dibang Valley); **h.** *Neope yama buckleyi* Talbot (Himachal Pradesh, Kullu) (Road Killed). Copyright: Figure 34a. Arajush Payra; Figures 34(b-g). Gaurab Nandi Das; Figure 34h. Ajvir Rawat.