Notes on the genus *Diarsia* with the description of seven new species from China (Lepidoptera: Noctuidae)

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Abstract

The description and diagnosis of seven new *Diarsia* Hübner, [1821] 1816 species (*D. rubrifusa* sp. nov., *D. alexanderi* sp. nov., *D. reserva* sp. nov., *D. sciurus* sp. nov., *D. zillii* sp. nov., *D. griseocilia* sp. nov., and *D. variolosus* sp. nov.) are provided. In addition, the distribution of the genus *Diarsia*, the research history of the Asiatic species and the main external and genitalia features of the seven new species and of their closest relatives are discussed, and illustrated with 44 imagines in colour, together with 27 males and 9 females genitalia.

Key words: *Diarsia*, new species description, south–eastern Palaeartic, Oriental, China.

Introduction

The genus *Diarsia* Hübner, (1821) 1816 has a wide, mostly Trans–Palaearctic and Oriental distribution; however a few species of the genus are also known from the Nearctic Region. The genus displays the highest diversity in the monsoon influenced regions of the Central and southern Himalaya (Nepal, India, Myanmar and Vietnam), through China (mainly the provinces of Xizang, Shaanxi, Gansu, Sichuan and Yunnan) to the Indonesian islands, and Australia and New Zealand in the South. A number of species are endemic to islands (Taiwan and, particularly, in the Indonesian islands and the Philippines). The most recent comprehensive study on the *Diarsia* by Varga & Ronkay (2007), gives a good overview on the history of the generic classification, divides species into species groups (which are accepted in this article), describes new species and reveals the female genitalia of numerous species for the first time. The survey and publishing of the female genitalia structure were very useful, since formerly the type designations and new descriptions had been done without the dissection of females, in most cases. Due to the formerly neglected survey of the female genitalia organs and the individual variability of certain species, the reliable identification of single females can be debatable. The most fundamental papers on the Chinese *Diarsia* were published by Boursin (1948 and 1954); the first includes important revisions of the formerly described types and some new descriptions, while in the second one the monographic elaboration of the genus with the description of 18 new species, mostly from the Höne material from China is provided. From the 1990s, further new species of *Diarsia* were described from China, Taiwan and the Himalaya (Boursin 1969, Chang 1991, Plante 1994,
Chen 1999, Hreblay & Plante 1995, Hreblay & Ronkay 1998, Xiong & Han 2010, Gyulai et al. 2011, 2013). As an addition, authors describe seven new species from China here below.

Taxonomic nomenclature and distributional data used in this study was constituted according to taxonomical experts and relevant literature (Boursin 1948, 1954, 1969; Chang 1991; Chen 1999; Gyulai et al. 2013, 2015; Hacker, 1992; Hampson 1894, 1896, 1898, 1903, 1908; Holloway 1976, 1989; Hreblay et al. 1999; Hreblay & Plante 1995; Hreblay & Ronkay 1998; Leech, 1900; Moore 1867, 1876, 1882; Sugi 1982; Varga & Ronkay 2007; Xiong & Han 2010.

Abbreviations for personal and institutional collections used herein include: AFM = Alessandro Floriani (Milan, Italy); ASV = Aidas Saldaitis (Vilnius, Lithuania); NHMUK = Natural History Museum, London, Great Britain (formerly BMNH = British Museum); HNHM = Hungarian Natural History Museum (Budapest, Hungary); ZFMK = Zoologisches Forschungsmuseum Alexander Koenig – Leibniz – Institut für Biodiversität der Tiere (Bonn, Germany); PGM = collection of Péter Gyulai (Miskolc, Hungary); GYP = genitalia slide of Péter Gyulai; RL = genitalia slide of László Ronkay.

Descriptions of new species

**Diarsia rubrifusa sp. n.**
(Figs 1, 2, 45, 46, 72)

**Type material. Holotype:** male (Fig. 1), China, Hunan, Nanling Mts., Shikengkong Mt., 1300 m, 24° 54’ N, 112 ° 57’ E; 1–30.XI.2006; leg. V. Siniaev & Team, slide GYP 5007, (coll. PGM, later to be deposited in the HNHM).

**Paratypes:** 2 males, with the same data as holotype; 5 males, 2 females, China, Hunan, Nanling Mts., Shikengkong Mt., 1500 m, 24° 54’ N, 112 ° 57’ E; 25.X. –30.XI.2003, leg. V. Siniaev (coll. PGM): 1 male, 3 females, China, Fujian, Dai Mao Shan; 60 km NW of Longyan, 25° 32’ N; 116° 51’ E, 1300 m, 21–30. XI. 2004, leg. V. Siniaev & Team, (coll PGM), slides GYP 3401, RL 8905 (males), GYP 2959, GYP 3404 (females).

**Diagnosis.** The new species (Figs 1–2) is the continental sibling species of the Taiwanese *Diarsia unica* Plante, 1995 (Figs 7–9). The two species are similar in the wing pattern, which is apparently almost the same, however *D. rubrifusa* significantly larger (37–43 mm, versus 32–36 mm), red suffused in the forewings (particularly in the males) and the reniform stigmata conspicuously yellow coloured (or in a few females ochre). These external characters provide an easy separation also from the *Diarsia nebula* (Leech, 1900) (Fig. 4) and *Diarsia axiologa* Boursin, 1954 (Fig. 3) (which are resembling in most features of the male genitalia), particularly from the bluish–grey ground coloured forewings of the *D. nebula*. In the male genitalia, the key features in comparison *D. rubrifusa* (Figs 45, 46) and *D. unica* (Fig. 51), are as follows: the new species has much shorter ampulla, broader cucullus “neck” and corona and differently shaped juxta; since the two dorsal extensions of the juxta form a broad U–shape, while this is V–shaped in the *D. unica*. *D. rubrifusa* compared to *D. nebula* (Figs 48, 49), the new species has much finer, weaker ampulla, larger cucullus and corona, U–shaped juxta and lacks the two strong, but short thorns of aedeagus. Finally from the *D. axiologa* (Fig. 47) it well differs by the less recurved harpe, much less sinuous ampulla and U–shaped juxta, which conspicuously less extended ventrally. The strongly sclerotized, dentate appendage of the carina, extending toward the basal part of the vesica, is the longest in the new species among the four taxa, but less strong than in the *D. axiologa*. In the female genitalia, the new species (Fig. 72) has much shorter, hardly sclerotized ducus bursae, significantly larger appendix bursae and longer saccate corpus bursae than in the *D. unica* (Fig. 73). The female genitalia of the externally and in the male genitalia more different and remote *D. nebula* and *D. axiologa* were not available.

**Description.** A large species (Figs 1–2), wingspan 37–43 mm; the females are slightly larger than the males. Antennae are thin, filiform in both sexes. Ground colour of head and thorax vesture and of the forewings is reddish–brown; more reddish suffused in the males, however rather brown suffused in certain females. The wing pattern is the darker shade of the ground colour, or dark brown, with the exception of the conspicuous yellow (or in certain females ochre) reniform stigmata (with black definition in the inner and lower edge) and...
Figures 1–8. *Diarsia* spp. adults. 1. *D. rubrifusa* sp. n., holotype, male, China, Hunan (PGM); 2. *D. rubrifusa* sp. n., paratype, female, China, Fujian (PGM); 3. *D. axiologa*, holotype, male, China, Shaanxi (ZFMK); 4. *D. nebula*, male, China, N Yunnan (ZFMK); 5. *D. coenostola*, holotype, male, China, Shaanxi (ZFMK); 6. *D. coenostola*, allotype, female, China, Shaanxi (ZFMK); 7. *D. unica*, male, Taiwan, Taitung (PGM); 8. *D. unica*, male, Taiwan, Nantou (PGM).
Figures 9–16. *Diarsia* spp. adults, 9. *D. unica*, female, Taiwan, Nantou (PGM); 10. *D. alexanderi* sp. n., holotype, male, China, W. Sichuan (PGM); 11. *D. alexanderi* sp. n., paratype, male, China, W Sichuan (ASV); 12. *D. alexanderi* sp. n., paratype, female, China, W Sichuan (ASV); 13. *D. robusta*, holotype, male, China, N. Yunnan (ZFMK); 14. *D. robusta*, allotype, female, China, N Yunnan (ZFMK); 15. *D. excelsa* holotype, male, Nepal, Kalinchok peak (HNHM); 16. *D. excelsa* female, Nepal, Kanchenjunga (PGM).
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Figures 17–24. Diarsia spp. adults. 17. D. reserva sp. n., holotype, male, China, Yunnan (PGM); 18. D. reserva sp. n., paratype, male, China, Yunnan (PGM); 19. D. reserva sp. n., paratype, male, China, Sichuan (PGM); 20. D. reserva sp. n., paratype, female, China, Yunnan (PGM); 21. D. mandarinella, syntype, male, China, Sichuan (NHMUK); 22. D. mandarinella, male, China, W Sichuan (PGM); 23. D. dichroa, male, China, Yunnan (PGM); 24. D. dichroa, female, China, Sichuan (PGM).
Figures 25–32. *Diarsia* spp. adults. 25. *D. sciusr* sp.n., holotype, male, China, Sichuan (PGM); 26. *D. sciusr* sp.n., paratype, male, China, Sichuan (AFM); 27. *D. sciusr* sp.n., paratype, male, China, Sichuan (PGM); 28. *D. sciusr* sp.n., paratype, male, China, Sichuan (ASV); 29. *D. sciusr* sp.n., paratype, female, China, Sichuan (ASV); 30. *D. gozmanyi*, holotype, male, Vietnam, Fansipan (HNHM); 31. *D. zillii* sp.n., holotype, male, China, Sichuan (PGM); 32. *D. griseithorax*, male, Nepal, Kanchenjunga (PGM).

the darker, brown subterminal and terminal fields. The ante– and postmedial lines are double, brown, the former one wavy, the latter one arched, the subterminal line reddish brown or brown. Claviform stigmata are formed only by a conspicuous black spot. Hindwings are brown, somewhat darker suffused in the diffuse marginal area, discal spots are dark brown, thin, broadly wedge–like. **Male genitalia.** *D. rubrifusa* (Figs 45,
46) can be characterised by the rather long, distally evenly thin, terminally tapering uncus; somewhat falciform harpe; laterally erected, long, terminally slightly dorsally curved ampulla; U–shaped juxta, with two symmetrical dorsal–lateral extensions; mediadly broaden valva with somewhat detached large cucullus and long corona covered with numerous long setae; slightly curved aedeagus and ample, globular vesica with a strongly sclerotized, dentate appendage of the carina extending onto the basal part of vesica and a large ventral surface structure of vesica, formed by numerous very fine, tiny setae. **Female genitalia.** The main characters (Fig. 72) are the broad, setose papillae anales and short apophyses anteriores; strongly sclerotized, U–shaped, postero–medially incised antrum with lobate, symmetrical postero–lateral sclerotization; broad, slightly sclerotized ductus bursae; large, ample, recurved appendix bursae with slight, sclerotized, folded ribs, and long, saccate corpus bursae, with a long Y–shaped and a long, modified signa in the wall.

**Biology and distribution.** The new species is known from the Chinese provinces of Hunan and Fujian only; a late autumnal species.

**Etymology.** The new species is named after the red suffused forewings.

**Diarsia alexanderi sp. n.**
(Figs 10, 11, 12, 50, 74)

**Type material.** Holotype: male (Fig. 10), China, W Sichuan, road Yaan/Kangding, Erlang Shan Mt., H–2161 m, N29°87’340”, E102°30’970”, 11–12.IX.2017, Saldaitis leg, slide GYP 4882, (coll. PGM, later to be deposited in the HNHM).

Paratypes: 1 male, 5 females, with the same data as holotype; 1 male, 1 female, China, W Sichuan, 25km. N. from Batang, H–3100 m, dry valley, N30°12.049’, E099°14.078’, 19–20.IX.2017, Saldaitis leg, (colls AFM & ASV), slide GYP 4925 (female).

**Diagnosis.** The new species (Figs 10, 11, 12) belongs to the hoenei species group, although externally the most resembling species is the *Diarsia coenostola* Boursin, 1954 (Figs 5, 6), from which it can be separated by the less elongate forewing apex, crenated antemedial line (which is tortuous in *D. coenostola*), arcuate postmedial line and obsolescence subterminal line, which is a considerable yellow line in the *D. coenostola*. It is more distinctive from the *D. robusta* Boursin, 1954 (Figs 13, 14); beside by the above mentioned features, in the new species the reniform stigmata are brownish, whereas those are yellowish coloured in the *D. robusta*. The brown ground colour of the forewing with light ochre–brown basal and medial area and much darker brown subterminal–terminal fields provide an easy separation also from the further species of the *D. hoenei* species group, which are resembling in most features of the genitalia (the most similar genitalia structure have the *Diarsia excelsa* Hreblay & Ronkay, 1998) (Figs 15, 16), however have reddish, red–brown, or rarely dark ochre and less varigate forewings. In the male genitalia, the most remarkable differences in comparison *D. alexanderi* (Fig. 50) to *D. coenostola* (Fig. 52) are included: the new species have longer uncus and very differently shaped, shield – like juxta, in which the slight dorsal incision separates two dorsal, symmetric small extensions with uneven dorsal surface, bearing both of them one–one tiny peaks in the middle; while this is V–shaped with a broad but shallow depression in the *D. coenostola*. This juxta shape is unique and the best key for separation from the rest of the taxa of the *hoenei* species group and also from those of the *D. robusta* (Fig. 53), which have broadly triangular juxta and the two tiny dorsal thorns are in the middle, close one to another. In the *hoenei* species group, the most corresponding species by the genitalia structure to *D. alexanderi* is the *D. excelsa* (Fig. 54), (which have red–brown forewings), however in the new species the ampulla is much recurred, tha harpe somewhat longer, the valva more extended medio–ventrally and the dorsal surface of juxta broader, more uneven, slightly pointed in the middle of both symmetrical extensions; while the dorsal section of juxta bears two flap–like symmetrical extensions in the *D. excelsa*. In the female genitalia, the most conspicuous differences are, in comparison *D. alexanderi* (Fig. 74), to *D. excelsa* (Fig. 75), are the shorter, however much broader, less sclerotized ductus bursae, significantly larger, globular appendix bursae and the remarkably larger corpus bursae. No reliable female genitalia of the externally and in the male genitalia more different and remote *D. robusta* and *D. coenostola* were available.
Figures 33–40. Diarsia spp. adults. 33. *D. griseocilia* sp. n., holotype, male, China, N Yunnan (PGM); 34. *D. griseocilia* sp. n., paratype, male, China, N Yunnan (ASV); 35. *D. griseocilia* sp. n., paratype, male, China, N Yunnan (ASV); 36. *D. rubicilia*, syntype, male, India, Darjiling (NHMUK); 37. *D. rubicilia*, male, Nepal, Kanchenjunga (PGM); 38. *D. luteosuffusa*, holotype, male, China, Shaanxi (PGM); 39. *D. variolosus* sp. n., holotype, male, China, Sichuan (PGM); 40. *D. variolosus* sp. n., paratype, male, China, Sichuan (PGM).
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Description. A large species (Figs10, 11, 12), wingspan 36–39 mm; females are slightly larger than the males. Antennae are thin, filiform in both sexes. The vesture of the head and thorax is brown. The forewings are varied brown coloured with light ochre–brown basal and medial area and much darker, brown subterminal–terminal area; while these are more unicolorous in the females. The orbicular and reniform stigmata are the same as the ground colour, being incompletely encircled with black definition. The wing pattern is dark brown, the ante– and postmedial transverse lines are double, the former one crenated, the latter one arched, the subterminal line obsolescent; the medial fascia broad, arched, diffuse. Hindwings are brown, discal spot defined by a darker brown, fine arch. Male genitalia. The most typical features (Fig. 50) are the rather long, pointed uncus; strong, somewhat curved harpe; laterally erected, long, medially dorsally recurved ampulla; shield–like juxta, in which the slight dorsal incision separates two dorsal, symmetric flap–like small extensions, bearing both of them one–one tiny peak in the middle; medially broaden valva with somewhat detached large cucullus with broad “neck” and long corona covered with numerous long setae; curved, short aedeagus and ample, globular vesica with a strongly sclerotized, long serrat bar of the carina extending toward the basal, slightly sclerotized part of the spacious vesica, in which a large field of scobinate ventral surface structure visible. Female genitalia. The main characters (Fig. 74) are the broad, setose papillae anales and the short apophyses anteriores; strongly sclerotized, U–shaped, broad, postero–medially deeply depressed antrum with two sclerotized, lateral, lobate, posteriorly tapering extensions; broad, more or less sclerotized, longitudinally ribbed ductus bursae; large, ample, globular appendix bursae and long, spacious, saccate corpus bursae, with one long and two shorter signa in its wall.

Biology and distribution. The new species is known from two valleys at the eastern edge of the Tibetan plateau in Chinese Sichuan province. The holotype male and few females were collected at ultraviolet light at altitude ranging 2200 m, in middle of September. Diarsia alexanderi was collected in virgin mixed forest habitat dominated by various broad–leaved trees such as oaks (Quercus dentata Thunberg, Quercus glauca Thunberg), poplars (Populus cathayana Rehder, Populus simonii Carrière), elm (Ulmus parvifolia Jacquin),
rhododendrons (*Rhododendron brachycarpum* G. Don, *Rhododendron dauricum* Linnaeus), and bamboos (*Phyllostachys* ssp., *Borinda* ssp., *Fargesia* spp.).

**Etymology.** The new species is dedicated to Mr. Alexander Seibald (Vienna, Austria).

**Diarsia reserva** sp. n.  
(Figs 17–20, 55, 56, 76).

**Type material.** Holotype: male (Fig. 17), China, prov. Yunnan, Bailakou pass, 3500 m, 63 km of Zhongdian, 1–3.VIII. 2010, leg. S Murzin, slide GYP 5022, (coll. PGM, later to be deposited in the HNHM).

Paratypes: 4 males, 1 female with the same data as holotype, (coll PGM); 3 males, China, prov. S. Sichuan, 20 km S of Xichang, 3000 m, 20–23.VII.2005, leg. S. Murzin (coll PGM), slides: GYP 2604 (male), GYP 5025 (male), GYP 5026 (male), GYP 5029 (female).

**Diagnosis.** The most recent investigations on the *chalcea* species group revealed the existence of another species in Yunnan and Sichuan, which is described here as new to science. Very likely, further one or two species are hidden in this species group, being close relatives to the *D. mandarinella* (Hampson, 1903) (= *Graphiphora mandarina* Leech, 1900; = *Agrotis mandarinella* (Hampson, 1903) (replacement name) (Figs 21, 22), *D. dichroa* Boursin, 1954 (Figs 23, 24), *D. metadichroa* Varga & Ronkay, 2007, *D. scotodichroa* Varga & Ronkay, 2007 and *D. hammienses* Xiong & Han, 2010. The holotypes of the latter four species are figured in colour by Varga & Ronkay (2007) and Xiong & Han (2010). The male syntype of *D. mandarinella* is figured here (Fig 21), its genitalia by Boursin as the type (1948c, plate 11, fig. 47); however this figure is poor and the vesica is not everted exactly; furthermore it was impossible to find in London, since had been deposited in a vial by Tams, without correct marking (personal comm. by A. Zilli). Later, Boursin found a further male in ZFMK, Bonn, which was published by him in 1954, with a footnote, mentioning, that it proved to be also *D. mandarinella*. However, its genitalia was not dissected, the specimen is somewhat worn and faded, and externally somewhat differs from the male syntype; thus conspecificity is debatable. Additionally, the above mentioned species are very similar to one another, in both the external features and genitalia structures, thus authors describe here only *D. reserve*, which well differs in the genitalia from all but one in this species group. The ground colour and wing pattern of the new species are apparently almost the same as in the closest relatives, but the orbicular and reniform stigmata are conspicuously encircled with yellow or rarely pale reddish–brown; additionally, the terminal section of the palpi is conspicuously clear white, while these are whitish, pale ochre, or light brown in the close relatives. Furthermore, it well differs from the male syntype of *D. mandarinella*, by the variegated, reddish–brown ground colour of forewings, while these are more unicolorous in the *D. mandarinella*. In the male genitalia, the structure is apparently very similar in the species group; the key features for separation are in the shape and size of ampulla, juxta, aedeagus and vesica armature. *D. reserva* (Figs 55, 56) compared to the closest relative species (Figs 57, 58) has more or less broader and deeper dorsal incision in the juxta; huge, strongly curved ampulla, which resembles only to those of the *D. mandarinella* (see: Boursin, 1948c, plate 11, fig. 47 and Fig. 57 in this article), in the species group. The most conspicuous differences are in the shape and structure of aedeagus and vesica. Only the new species has straight or almost straight aedeagus with the absence of the acute, strong, thorn–like ventral process; additionally, the aedeagus bears an unique, longitudinal strongly sclerotized configuration, starting broadly then converging, finally running parallel, then meeting in a slight or obtuse node (which is best visible in the lateral view, however is not an acute, strong, thorn–like process, as in the close related species), continuing with a sclerotized thin bar onto the basal part of vesica and ending in a strongly sclerotized, subbasal dentate plate. The vesica is less elongate than in the similar species, more broadly covered by the large number of tiny spiculi and lacks the other structures and the small subterminal diverticulum, which are typical in most of the relative species. In the female genitalia, *D. reserva* (Fig. 76) can be easily distinguished by the structure of the ductus bursae. The new species has the broadest anterior section of the ductus bursae, which is strongly sclerotized and not rugulosus, as in all of the close relatives (Fig. 77 and Varga & Ronkay (2007); the female genitalia of the *D. mandarinella* was not available).
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Figures 45-49. *Diarsia* spp. male genitalia. 45. *D. rubrifusa* sp. n., holotype, China, Hunan, GYP 5007 (PGM); 46. *D. rubrifusa* sp. n., paratype, China, Fujian RL 8905 (PGM); 47. *D. axiologa*, holotype, China, Shaanxi, Hö 25, Lep0003164 (ZFMK); 48. *D. nebula*, China, N Yunnan, Hö 6, Lep0003145 (ZFMK); 49. *D. nebula*, China, Sichuan, GYP 2538 (PGM).
Figures 50-54. Diarsia spp. male genitalia. 50. *D. alexanderi* sp. n., holotype, China, W Sichuan, slide GYP 4882 (PGM); 51. *D. unica*, Taiwan, Nantou, slide GYP 5011 (PGM); 52. *D. coenostola* holotype, China, Shaanxi, Hō 20, Lep0003159 (ZFMK); 53. *D. robusta*, paratype, China, N Yunnan, Boursin, 2544 (ZFMK); 54. *D. excelsa*, holotype, Hreblay 7659 (HNHM).
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Figures 54-58. Diarsia spp. male genitalia. 55. *D. reserva* sp. n., holotype, China, Yunnan, GYP 5022 (PGM); 56. *D. reserva* sp. n., paratype, China, Yunnan, GYP 2604 (PGM); 57. *D. mandarinella*, China, W Sichuan, GYP 4164 (PGM); 58. *D. dichroa*, China, Yunnan, RL 8935 (PGM).
59. *D. sciurus* sp. n., HT, GYP 2389

60. *D. sciurus* sp. n., PT, GYP 5054

61. *D. sciurus* sp. n., PT, GYP 5056

62. *D. gozmanyi*, HT, RL 8601

**Figures 58-62.** *Diarsia* spp. male genitalia. 59. *D. sciurus* sp. n., holotype, China, Sichuan, GYP 2389 (PGM); 60. *D. sciurus* sp. n., paratype, China, Sichuan, GYP 5054 (PGM); 61. *D. sciurus* sp. n., paratype, China, Sichuan, GYP 5056 (ASV); 62. *D. gozmanyi*, holotype, Vietnam, Fansipan, RL 8601 (HNHM).
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63. D. zillii sp.n., HT, GYP 2385

64. D. griseithorax, Hreblay 12374

65. D. griseocilia sp.n., HT, GYP 4997

66. D. griseocilia sp.n., PT, GYP 4942

Figures 63-66. Diarsia spp. male genitalia. 63. D. zillii sp.n., holotype, China, Sichuan, GYP 2385 (PGM); 64. D. griseithorax Nepal, Kanchenjunga, slide Hreblay, 12374 (PGM); 65. D. griseocilia sp. n., holotype, China, N Yunnan GYP 4997 (PGM); 66. D. griseocilia sp. n., paratype, China, N Yunnan GYP 4942 (ASV).
Description. (Figs 17–20). Wingspan 30–33 mm. Antennae are thin, filiform, palpi dark brown, distally white; vertex pale ochre. Ground colour of the head and thorax vesture and of the forewings is variegated; red–brown, however somewhat darker suffused in the inner edge. The wing pattern is well recognizable, defined with blackish or dark brown. The basal– and antemedial lines are slightly zigzag, the postmedial lines arched and crenated, subterminal lines wavy, pale ochre or reddish brown. The orbicular and reniform stigmata are typical, completely outlined with yellow or pale reddish–brown; the claviform stigmata conjectural. Hindwings are brown, discal spot is a darker brown arch. Male genitalia. The main features of *D. reserva* (Figs 55, 56) are the followings: rather long, almost evenly thin, terminally tapering uncus; falcate, terminally tapering harpe; huge, curved ampulla; shield–like juxta with dorsal appendage, which is divided to two symmetrical, diverging extensions by a deep medial incision; ventro–medially broaden valva with somewhat detached large, hairy cucullus and corona, with numerous thin setae; straight aedeagus, having a longitudinal strongly sclerotized configuration, starting broadly then converging and running parallel then meeting in a slight or obtuse node, continuing with a sclerotized slim bar onto the basal part of vesica and ending in a large, strongly sclerotized, subbasal dentate plate; cylindrical vesica, which is broadly and densely covered by a large number of tiny spiculi. Female genitalia. The main characters (Fig. 76) are the setose, elongate papillae anales, short apophyses anteriores and long apophyses posteriores; strongly sclerotized, antrum with large, bilateral symmetrical lobi and a flap–like antero–medial appendage; large, long, medially slightly constructed ductus bursae; small, not detached appendix bursae and spacious, saccate corpus bursae with two longitudinal and a small signa.

Figures 70-71. *Diarsia* spp. male genitalia. 70. *D. variolosus* sp. n., holotype, China, Sichuan, GYP 4674 (PGM); 71. *D. metatorva*, paratype, China, Sichuan, GYP 2701 (PGM).
Figure 72-77. Diarsia spp. female genitalia. 72. D. rubrifusa sp.n., paratype, China, Fujian, GYP 2959 (PGM); 73. D. unica, Taiwan, Nantou, slide GYP 5012 (PGM); 74. D. alexanderi sp.n., paratype, China, W Sichuan, slide GYP 4925 (ASV); 75. D. excelsa, Nepal, Kanchenjunga, GYP 5031 (PGM); 76. D. reserva sp.n., paratype, China, Sichuan, GYP 5029 (PGM); 77. D. dichroa, China, Sichuan, GYP 3266 (PGM).
The new species is known from the Chinese provinces of Yunnan and Sichuan only; a mid–summer species.

Etymology. The Latin “reserva” means “reserve”, “spare”, indicates that this new species was found among the debatable specimens of the chalcea group.

**Diarsia sciurus sp. n.**
(Figs 25–29, 59–61, 78)

**Type material. Holotype:** male (Fig. 25) China, Sichuan, road Yaan/Kangding, Erlang Shan Mt., H–2161 m, N29°51', E102°18', 12.VII.2009, I.–A. Floriani & Saldaitis leg, slide: GYP 2389, (coll. PGM, later to be deposited in the HNHM).

**Paratypes:** 1 male, with the same data as holotype, (coll AFM); 19 males, China, W Sichuan, Yaan/Kangding, Erlang Shan Mt., H–2000 m, N29°87'340, E102°30'970, 27.VI.2019, Butvila & Saldaitis
Diagnosis. The new species is similar to some species of the *chalcea* species group, particularly to the *D. mandarinella* (Figs 21, 22) and *D. dichroa* (Figs 23, 24), however, in the male genitalia capsule shows closer affinities to the *D. gozmanyi* Varga et Ronkay, 2007 (Fig. 30) and in some features also to those of the *D. griseithorax* Warren, 1912 (Fig. 32), which is a member of the *basistriaga–cerastioides–tincta* species group (Varga et Ronkay, 2007). It is remarkably dissimilar from all but one of the resembling/close relative species by the unicolorous reddish–brown ground colour with darker red–brown suffusion and the strongly defined ante– and postmedial lines in the forewing pattern, in which the antemedial lines are slightly zigzag, encircling the orbicular spots on the inner edge and converging toward the middle of the inner costa. In the *male genitalia*, the structure (Figs 59–61), reveals a mixture of those of the *D. gozmanyi* (Fig. 62), *D. dichroa* (Fig. 58), and *D. griseithorax* (Fig. 64); in its most features is similar to those of the first two species, while the shape and size of the juxta and the clasper–like extension of the harpe, are resembling to the third one. *Diarsia sciuress* can be distinguished from the *D. gozmanyi* by the longer uncus and ampulla; distally less extended harpe; much smaller, lower juxta, with less deep dorsal medial incision and shorter, but broader dorsal extensions; broader, but in the ventral–medial section less extended, rounded valvae; large, strongly sclerotized trapezoid plate of the aedeagus carina, extending onto the subbasal section of the vesica and the absence of the subterminal diverticulum. It differs from the *D. dichroa*, by the longer uncus, much smaller, lower juxta; shorter ampulla, the presence of a small clasper–like extension of the ampulla and the large, strongly sclerotized trapezoid plate of the aedeagus carina, extending onto the subbasal section of the vesica; finally the absence of the subterminal diverticulum; from those of the *D. griseithorax*, by the much shorter ampulla and clasper, the presence of the strong, broad sclerotization and large thorn–like process of the ventral side of aedeagus, the strongly sclerotized trapezoid plate of the aedeagus carina, extending onto the subbasal section of the vesica, finally the very distinctive vesica configuration. In the *female genitalia*, the new species (Fig. 78) can be easily distinguished from the close relative congeners by the shape of the corpus bursae; it has the most elongated saccate corpus bursae, with two long and one short signa. Additionally, from the most similar *D. dichroa* it differs in the configuration of the strongly sclerotized antrum, since the large, bilateral symmetrical lobi lack the recurved appendages and the flap–like antero–medial appendage also absent; (the female of the *D. gozmanyi* is unknown).

Description. Wingspan 29–34 mm. Antennae are thin, filiform, palpi dark brown, terminally pale–ochre, or whitish; frons pale red–brown. Ground colour of the head and thorax vesture and of the forewings is red–brown, with darker red–brown suffusion in the forewings in most of the specimens. The wing pattern is defined with blackish or dark brown. The basal– and antemedial lines are slightly zigzag, forming a half circle on the inner edge of the orbicular spots and converging toward the middle of the inner costa; the postmedial lines arched and crenated, subterminal lines conjectural. The orbicular and reniform stigmata are typical, however not conspicuous, due to the absence of the outlines and the ground colour of them, which is only slightly lighter than those of the forewings. Hindwings are brown, or dark brown, discal spots darker brown, the cilia is pale pinkish. Male genitalia. The main features of *D. sciuress* (Figs 59 – 61) are the followings: rather long, almost even slender, terminally tapering uncus; falcate, distally thin and short harpe with a slight, clasper–like process; short and thin, terminally slightly curved ampulla; shield–like, low juxta with dorsal appendage, which is divided to two flap–like extensions by a medial incision; ventro–medially broadly, rounded valvae with somewhat detached large, hairy, distally elongated, terminally tapering cucullus and corona, with numerous thin setae; strongly curved aedeagus, with strong, broad sclerotization and large thorn-like process of the ventral side, continuing in a strongly sclerotized trapezoid plate of the aedeagus carina, extending onto the subbasal section of the vesica, ending in a small ventral plate with a few slight spikes; medially ample vesica, with a large medial configuration of dense setae and the presence of a ventral, scythe–like, strongly sclerotized bar. Female genitalia. The main characters (Fig. 78) are the setose, elongate papillae anales, tiny apophyses anteriores and long apophyses posteriores; strongly sclerotized, antrum with large, bilateral symmetrical lobi; the absence of the antero–medial appendage; large, long, anteriorly ribbed, posteriorly extending and slightly sclerotized ductus bursae; not detached appendix bursae and elongated corpus bursae with two longitudinal and a short signa.
Biology and distribution. The new species is known only from the Erlang Shan Mountains at the eastern edge of the Tibetan plateau in the Chinese Sichuan province. Series of males and two females were collected at ultraviolet light at altitude ranging 2100 m, in June and July. The new species was collected in virgin mixed forest habitat dominated by various broad-leaved trees such as oaks (Quercus dentata Thunberg, Quercus glauca Thunberg), poplars (Populus cathayana Rehder, Populus simonii Carrière), elm (Ulmus parvifolia Jacquin), rhododendrons (Rhododendron brachycarpum G. Don, Rhododen dron dauricum Linnaeus), and bamboos (Phyllostachys ssp., Borinda ssp., Fargesia ssp.).

Etymology. The Latin “sciurus” means squirrel (Sciurus vulgaris), indicating the similar red–brown forewings of this new species.

Diarsia zillii sp. n. (Figs 31, 63)

Type material. Holotype: male (Fig. 31) China, Sichuan, road Yaan/Kangding, Erlang Shan Mt., H–2161 m, N29°51’, E102°18’, 12.VI.2009, I.– A. Floriani & Saldaits leg, slide GYP 2385 (coll. PGM, later to be deposited in the HNHM).

Diagnosis. The new species (Fig. 31) is a specialty, representing a distinct lineage. The male genitalia structure of the new species resembling to some species of the chalcea group, however the vesica structure indicates some affinities to those of the basistriga–cerastioides–tincta species group, particularly to the D. griseithorax. It is remarkably dissimilar in the external features from all the congeneric taxa of the chalcea species group by the greyish ground colour with slight whitish suffusion in the forewings (which is red, reddish brown all but one in the chalcea species group), and more similar to the D. griseithorax (Fig. 32), although the male genitalia structure is apparently matches in most sections with those of the chalcea species group. The separation of the D. zillii from the D. griseithorax is very easy, since the new one is larger (34 mm versus 30 mm), having greyish forewings with whitish suffusion in the basal and medial area and the stigmata are finely whitely outlined; while in the D. griseithorax forewings are more unicolorous, without the whitish suffusion, but with reddish hue. Additionally, the new species has much darker hindwing. In the male genitalia, the new species (Fig. 63), shows shared features with the D. mandarinella (Fig. 57) and D. dichroa (Fig. 58), indicated particularly by the huge ampulla and high juxta. The best distinctive key features are the somewhat longer, almost evenly slender uncus; much higher, huge juxta, with two asymmetric dorsal extensions; larger, longer, falcate harpe; huge ampulla, distally with rough configuration and the narrower neck of cucullus. The differences are more surprisingly larger in the aedeagus and vesica structure, by the absence of the ventral thorax in the aedeagus and the very different and unique, significantly larger, dorsally also elongate vesica structure, with the asymmetrically huge fields of dense setae and ventrally with an elongate, scythe-like, strongly sclerotized bar. D. zillii conspicuously differs from the externally somewhat similar D. griseithorax (Fig. 64) by the considerably higher, huge juxta, with two asymmetric dorsal extensions; longer, falcate harpe and the absence of clasper; huge ampulla, narrower neck of cucullus, huge, elongate vesica structure, with unevenly situated dorsal fields of dense setae and the presence of the ventral scythe-like, strongly sclerotized bar. Female genitalia is unknown.

Description. A medium sized species, wingspan 34 mm. Antenna of the male is thin, filiform. Ground colour of head and thorax ventrue and of the forewings is unicolorous slate grey with whitish suffusion in the basal and medial area in the forewings; only in the subapex visible a diffuse, darkened patch. The wing pattern is also greyish, but well discernible, since the basal–, ante– and postmedial lines are defined with double, dark brown, fine lines; the antemedial line somewhat zigzag, oblique toward the inner costa, the postmedial line arched; the subterminal line almost straight, thin ochre line with slight brown ghost in the inner side. Orbicular and reniform stigmata are light grey, incompletely whitish outlined. Hindwings are unicolorous brown with pale pinkish cilia; discal spot conspicuous, lunular, a dark brown fine arch. Male genitalia. The most typical features of the male clasping apparatus (Fig. 63) are as follows: relatively long, distally slightly tapering uncus; huge juxta, with two dorsal, asymmetric bilateral extensions and deep medial incision between them; large, strong, distally curved ampulla, with rough configuration; long, falcate, distally tapering, apically pointed harpe; ventro–latterally broaden, convex valva with weak “neck” of the
large cucullus bearing a streak of strong, long spiculi; slightly curved aedeagus, with longitudinal sclerotized bars distally and ribbon-like, strongly sclerotized, long serrate–dentate bar of the carina extending onto the basal section of vesica; huge, elongate vesica structure, with a large dorsal extended field of dense setae and the presence of a long ventral, scythe-like, strongly sclerotized bar.

**Biology and distribution.** The new species is known only from the Erlang Shan Mountains at the eastern edge of the Tibetan plateau in the Chinese Sichuan province. Single male was collected at ultraviolet light in mid of June at altitude ranging 2100 m. The new species was collected in virgin mixed forest habitat dominated by various broad-leaved trees such as oaks (*Quercus dentata* Thunberg, *Quercus glauca* Thunberg), poplars (*Populus cathayana* Rehder, *Populus simonii* Carrière), elm (*Ulmus parvifolia* Jacquin), rhododendrons (*Rhododendron brachycarpum* G. Don, *Rhododendron dauricum* Linnaeus), and bamboos (*Phyllostachys* ssp., *Borinda* ssp., *Fargesia* ssp.).

**Etymology.** The new species is dedicated in honour to Alberto Zilli, well known noctuidologist, curator of the Noctuidae collection in the Natural History Museum London.

**Diarsia griseocilia** sp. n.
(Figs 33–35, 65–67)

**Type material.** Holotype: male (Fig. 33), China, N Yunnan, road Dali/Yongping H–2330 m, N25°29’29”, E99°38’38”, 11–12.V.2017, Butvila & Saldaitis leg, slide: GYP 4997, (coll. PGM, later to be deposited in the HNHM).

**Paratypes:** 4 males with the same data as holotype. (colls AFM & ASV), slides GYP 4942, GYP 4995 (males).

**Diagnosis.** The new species (Figs 33–35) is the member of the *erubescens* group. Surprisingly, the male genitalia of *D. griseocilia* is apparently corresponding in most sections to those of the *Diarsia rubicilia* (Moore, 1967) (Figs 36, 37) and *Diarsia luteosuffusa* Gyulai, Ronkay, Ronkay & Saldaitis, 2013 (Fig. 38), although these are very dissimilar in the ground colour and forewing pattern. The separation of the new species from the two relatives is very easy, since the new species has grey coloured forewings, whereas those are red, orange–red (in one of them yellow suffused) in the two congeners. Additionally, the cilia of the forewings is unicolorous grey, of the hindwings pale ochre in the *D. griseocilia*, while orange – red in all the four wings of the two congeners. The new species is somewhat larger (32–35 mm, versus 28–32 mm). In the male genitalia, the key features comparing the new species (Figs 65–67) to *D. rubicilia* (Fig. 68) and *D. luteosuffusa* (Fig. 69) are in the shape and size of uncus, juxta, harpe and ampulla. *D. griseocilia* has longer, rather thin, not spatulate uncus (while this is somewhat spatulate in the two relative species), apically with some strong spines; more or less shorter ampulla, remarkably weaker, slightly falcate harpe, differently shaped juxta, in which the two dorsal extensions somewhat shorter and rather parallel, forming a broad U–shape; while these are diverging, forming V–shape in the two congeners. **Female genitalia.** Female is unknown.

**Description.** A medium sized species, wingspan 32–35 mm. Antennae of males are thin, filiform. Ground colour of head and thorax vesture and of the forewings is unicolorous slate grey, only in the subapex visible a diffuse, darker patch. The wing pattern is also greyish, but well discernible, since the ante– and postmedial lines are defined by double, dark brown, fine lines; the former one somewhat zigzag, the latter one finely wavy; the subterminal line simple, but conspicuous, slightly wavy. Orbicular and reniform stigmata are grey, finely outlined. Hindwings are light greyish brown with pale ochre shade, somewhat darker suffused in the diffuse marginal area; discal spot conspicuous, dark brown. The cilia of the forewings is unicolorous grey, while pale ochre in the hindwings. **Male genitalia.** The main characters of *D. griseocilia* (Figs 65–67) are included: rather long, distally slightly broadened uncus, apically with some strong spines; juxta with two dorsal, more or less parallel bilateral extensions, forming a broad U–shape; laterally erected short ampulla, slightly falciform, distally tapering harpe; ventro–laterally broadened, convex valva with somewhat detached small cucullus with slender neck; slightly curved aedeagus and ample vesica with a strongly sclerotized,
serrate–dentate appendage of the carina extending onto the basal section of the vesica, which bears a large spiculiform field basally–subbasally and a large, long, finger–like diverticulum, terminated with a large structure of bunches of fine spiculi.

**Biology and distribution.** Five males were collected at ultraviolet light during single rainy night at mid of May, 2017 in a Yongping County in southwestern Yunnan Province’s Qingshulang Shan mountain range. The new species was collected at altitudes of approximately 2300 meters in scarce mountain mixed forest, in between small agriculture fields, dominated by various deciduous trees, bamboo and bushes.

**Etymology.** The new species is named after the grey cilia of forewings.

**Diarsia variolosus sp. n.**
(Figs 39–41, 42, 70, 79)

**Type material.** Holotype: male (Fig. 39), China, Aba town surroundings, 3400 m a. s. l., 8–10. VIII.2016, leg. native collector, slide GYP 4674, (coll. PGM, later to be deposited in the HNHM).

**Paratypes:** 3 males, 2 females with the same data as holotype; (coll. PGM), slides GYP 4913 (male), GYP 4908 (female).

**Diagnosis.** *Diarsia variolosus* (Figs 39–42) is the fifth species in the *torva* species group. It is very distinctive from all but one by the broader, variegate ochre, red–ochre, red–brown forewings, while those are different shades of the brown in the close relative congeners; additionally the wing pattern is significantly more defined. The most corresponding species in the genitalia structure is the *Diarsia metatorva* Varga & Ronkay, 2007 (Figs 43, 44), but the above mentioned features and the much lighter hindwing provide easy separation without genitalia dissection. In the male genitalia, the structures in this species group are apparently almost the same. The most recognizable differences are provided: in the new species (Fig. 70), the dorsal extension of the juxta is shorter, finer; the cucullus “neck” somewhat broader; the medio–ventral extension of the valva is much larger. The armature of the vesica well differs from the closest relative *D. metatorva* (Fig. 71), since the large, strongly sclerotized, laminar serrate plate in the vesica is oppositely situated in the *D. variolosus* sp. n. and shorter but broader, more serrate; the vesica bears three bunches of strong spines, while in the *D. metatorva* only one group discernible, near the longer but less serrate plate. In the female genitalia, *D. variolosus* (Fig. 79) well differs in two characters from all but one of the species of the *torva* group: the new species have the most elongate papillae anales and medially poorly depressed antrum with fine, postero–lateraly diverging, apically pointed and not lobate extensions.

**Description.** Wingspan 34–38 mm; the females are slightly larger than the males. Antennae are thin, filiform, however with fine, short setae in the males. Ground colour of head and thorax vesture and of the forewings is variegated; ochre, red–ochre, red–brown however somewhat darker suffused in certain females. The wing pattern is well recognizable, defined with brown. The ante– and postmedial lines are simple or double, the former ones wavy, the latter ones arched and crenated, subterminal lines conjectural, fine, pale ochre or reddish brown. The orbicular and reniform stigmata are typical, or more or less outlined with fine brown; the latter ones with black definition in the lower border, while the claviform stigmata marked only by a black dot. Hindwings are light brown, somewhat darker suffused in the diffuse marginal area, discal spots a darker brown arch. Male genitalia. The most recognizable features of *D. variolosus* (Fig. 70) are as follows: rather long, evenly thin, terminally tapering uncus; falcate harpe, basally with a strong, digitiform extension; thin, straight ampulla; shield–like juxta with dorso–apical appendage; ventro–medially broaded valva with somewhat detached large cucullus, covered with numerous long setae; slightly curved aedeagus; simple vesica with a large, strongly sclerotized, laminar serrate plate and oppositely with ventral structure of three bunches of strong cornuti. Female genitalia. The main characters (Fig. 79) are the setose papillae anales and short apophyses anteriores and posteriores; strongly sclerotized, V–shaped, postero–medially broadly depressed antrum with postero–lateral, symmetrical, diverging, apically pointed processi; large, globular, strongly sclerotized appendix bursae and saccate corpus bursae.
Biology and distribution. The new species is known from the Chinese province of Sichuan only; a late summer species.

Etymology. The new species is named after the variegate forewings.

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