



First report on *Paratischeria* from Asia (Lepidoptera: Tischeriidae)

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Abstract

We provide the first report on the leaf-mining Tischeriidae genus *Paratischeria* Diškus & Stonis from Asia. We describe *Paratischeria jingdongensis* Xu & Dai, **sp. nov.**, a new species discovered in Yunnan, China, feeding on *Dalbergia assamica* Benth., Fabaceae and redescribe *P. hestias* (Meyrick, 1915), **comb. nov.**, a hitherto very little known species from India, which has been recently discovered in northern Vietnam, feeding on *Helicteres viscida* Blume, Malvaceae. We also report on the Fabaceae family as a novel host-plant family of Tischeriidae. The described and redescribed *Paratischeria* species are illustrated with photographs of the leaf-mines, adults, genitalia, and habitats. We also provide maps of new *Paratischeria* findings, and, along with a diagnostic scheme to the genus, present some data on global distribution of *Paratischeria* occurring in tropical and subtropical regions on both sides of the Equator. In addition, we designate a new *Paratischeria neotropicana* species group and provide two more new taxonomic combinations: *Paratischeria heteroterae* (Frey & Boll, 1878) **comb. nov.** and *P. capnota* (Meyrick, 1915) **comb. nov.**

Key words: China, *Dalbergia assamica*, *Helicteres isora*, *Helicteres viscida*, host plants, leaf-mines, new species, *Paratischeria*, Tischeriidae, Vietnam, Yunnan

Introduction

Tischeriidae is a rather small family in comparison with many other families of Lepidoptera and now it comprises four genera and about 120 described species (Braun 1972; Robinson *et al.* 2001; Diškus & Puplesis 2003a, 2003b; Stonis *et al.* 2017); however, judging from available undescribed material, the number of species may increase dramatically in rather a short period of time.

During the recent years, literature on Tischeriidae was supplemented with the following publications: Landry & Roque-Albelo 2004; Puplesis *et al.* 2004; Mey 2004, 2010; Diškus 2005; Puplesis & Diškus 2005; Diškus & Stonis 2006, 2012, 2015; Stonis & Diškus 2007, 2008; Lees & Stonis 2007; Stonis *et al.* 2008, 2014, 2016, 2017; Huang & Tan 2009; van Nieukerken 2010; Navickaitė *et al.* 2011; Diškus *et al.*, 2014; and Kobayashi *et al.*, 2016. For the review of older publications, see Diškus & Puplesis (2003a).

The first review on the biology of Tischeriidae was provided by Braun (1972); much later it was reviewed by Diškus & Puplesis (2003a) and some new data were recently added by Kobayashi *et al.*, (2016) and Stonis *et al.* (2017). In total, sixteen host-plant families have been reported for the family: Euphorbiaceae, Rosaceae, Rhamnaceae, Fagaceae, Betulaceae, Malvaceae, Combretaceae, Ericaceae, Symplocaceae, Anacardiaceae, Theaceae, Hypericaceae, Apocynaceae, Asteraceae (Diškus & Puplesis 2003a, 2003b; Diškus 2005; Kobayashi *et al.* 2016), and Urticaceae (Stonis *et al.* 2017). In the current paper, the Fabaceae family is added. Among all these diverse host-plant families, Rosaceae and Fagaceae appear to be predominant host-plant groups in temperate regions (Braun 1972, Diškus & Puplesis 2003a, Dai *et al.* 2017) while host plants from Malvaceae and Asteraceae are most common in tropical and subtropical regions, in particular in the Neotropics (Stonis *et al.* 2017).

The genus of *Paratischeria* was recently described by A. Diškus and J. R. Stonis (Stonis *et al.* 2017) on the basis of several Urticaceae, Malvaceae, and Asteraceae-feeding Neotropical species and one Afrotropical Urticaceae-feeding species. Until now, only two genera (*Tischeria* Zeller and *Coptotriche* Walshingham) were reported from China as well as other East Asian and Southeast Asian countries (Puplesis & Diškus 2003b, Huang & Tan 2009, Sato 1993, Stonis *et al.* 2014, Kobayashi *et al.* 2016). Nothing was known about *Paratischeria* in Asia.

This paper is the first to report on the discovery of *Paratischeria* in Asia. We describe one new *Paratischeria* species, redescribe one hitherto little-known species and provide new host-plant data: *Helicteres viscida*, Malvaceae for *Paratischeria hestias* (Meyrick, 1915) **comb. nov.** and *Dalbergia assamica*, Fabaceae for *P. jingdongensis* Xu & Dai, **sp. nov.** Previously, neither *Helicteres* L. nor *Dalbergia* L.f. were known as host-plant genera, nor Fabaceae as a host-plant family for any Tischeriidae.

Material and methods

Collecting methods, techniques for genitalia preparation, and protocols for description are outlined in Puplesis & Robinson (2000), Puplesis & Diškus (2003), and Diškus & Stonis (2012).

Adults were reared from leaves with feeding larvae or pupae in January–February, 2017 (*Paratischeria hestias*) and in July–August, 2015 and 2016 (*P. jingdongensis*). Host-plant leaves with leaf-mines of *P. jingdongensis* were scanned separately by Epson Expression 10000XL scanner. Adult morphology of *P. jingdongensis* was studied using a Leica M-205C stereomicroscope and adult photographs were taken with a Canon 7D + Canon MP-E 65mm f/2.8 1-5x Macro Photo Lens. Genital morphology was examined using an Olympus BX-53 microscope and the illustrations were prepared using an Olympus DP-26 digital camera connected to an Olympus BX-53 microscope. Permanent slides of *P. hestias* were studied and photographed using a Leica DM2500 microscope and a Leica DFC420 digital camera.

The descriptive terminology of morphological structures and the classification of Tischeriidae follow Puplesis & Diškus (2003) and Stonis *et al.* (2017).

Abbreviation for specimen depository:

BMNH The Natural History Museum, London, United Kingdom;
GNU School of Life and Environmental Science, Gannan Normal University, Jiangxi, China;
LEU Lithuanian University of Educational Sciences, Vilnius, Lithuania (temporary deposition, with intended further re-deposition at Vietnam Academy of Sciences and Technology, Hanoi, Vietnam; or ZMUC).

Taxonomy

Genus *Paratischeria* Diškus & Stonis, 2017

Type species: *Paratischeria ferruginea* Diškus & Stonis, 2017 (Stonis *et al.* 2017).

For the diagnostic scheme of the genus see Fig. 1; more explanation on the genus is provided in Discussion.

Paratischeria jingdongensis Xu & Dai, **sp. nov.**

(Figs 2–13, 38, 39)

Type material. ♂, CHINA: Taizhong Town, Jingdong Yi Autonomous County, Pu'er City, Yunnan Province, 24.495 N, 100.936 E, elevation 1478 m, feeding larvae in leaf-mines on *Dalbergia assamica* Benth., adults emerged 26.viii.2016, Jiasheng Xu, genitalia slide no. BX16008♂. Paratypes: 1 ♂, 2 ♀, same label data as holotype, genitalia slide nos BX16009♀ (allotype), BX16020♂, BX16027♀.

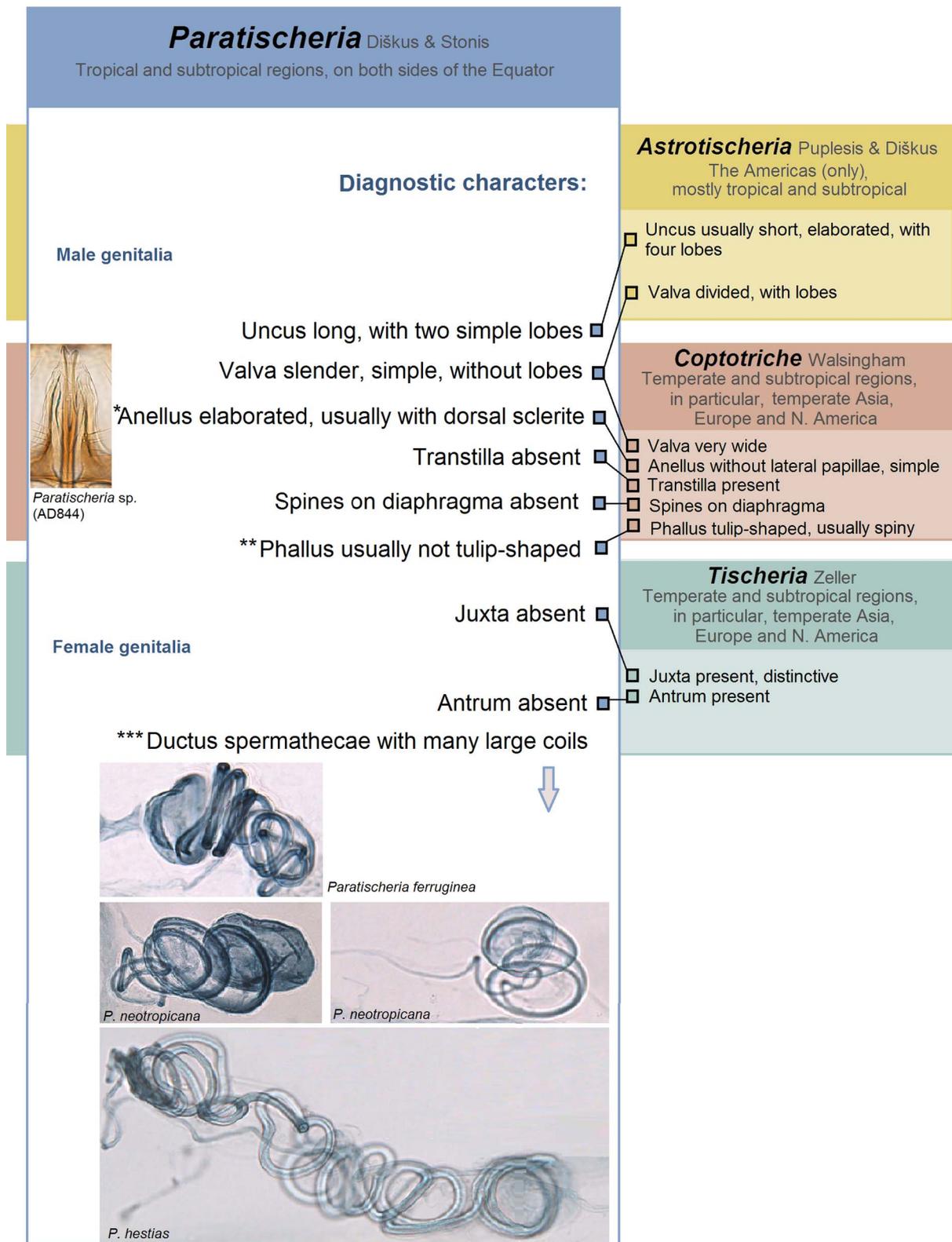


FIGURE 1. Diagnostics of the *Paratischeria* genus. * for more illustrations of anellus see Stonis *et al.* 2017; ** with very rare exceptions, e.g. *Paratischeria jingdongensis* Xu & Dai, **sp. nov.**; *** the character has been studied and confirmed in some six *Paratischeria* species; however, more research is still needed to determine the applicability of this character in the diagnostics of the *Paratischeria* genus.

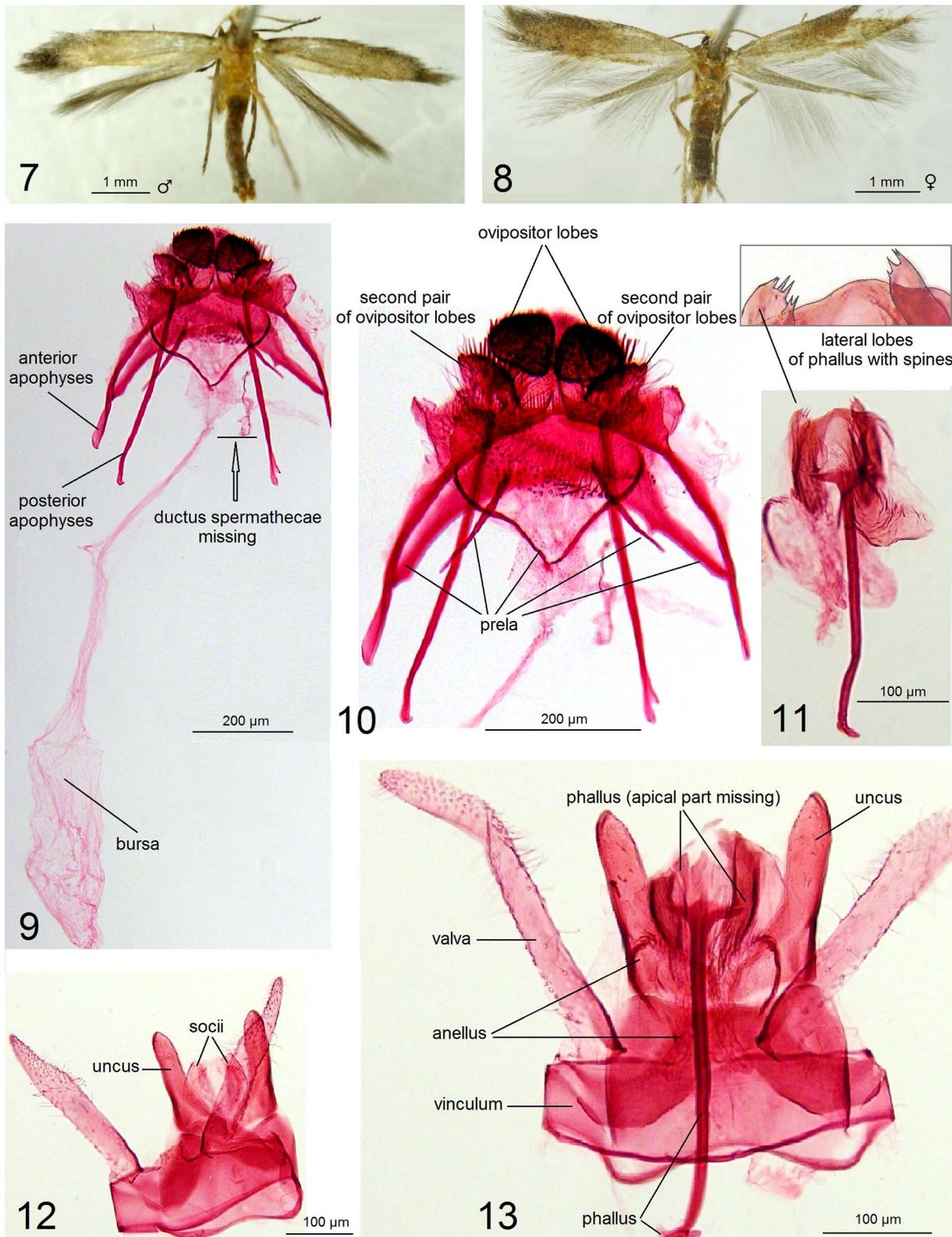


FIGURES 2–6. *Paratischeria jingdongensis* Xu & Dai, *sp. nov.*, Yunnan Province, China. 2, 3, habitat, montane subtropical broadleaf evergreen forest in Jingdong, Yunnan Province, China; 4, host plant *Dalbergia assamica* Benth., Fabaceae (Leguminosae); 5, 6, leaf-mines.

Diagnosis. In the male genitalia, the combination of a slender valva, specific anellus, very short vinculum and spiny phallus distinguishes new species from all other known Tischeriidae. In the female genitalia, the combination of very large ovipositor lobes, and a specific prela (Fig. 10) distinguishes *P. jingdongensis* from other congeneric Tischeriidae. The Fabaceae host plant *Dalbergia assamica* also makes this species distinctive.

Male (Fig. 7). Forewing length: 2.8–3.1 mm; wingspan: 6.7–7.2 mm. Head: face and palpi unicolorous, cream ochre; face smoothly scaled, glossy; frontal tuft ochre; antenna slightly longer than 2/3 of the length of forewing; flagellum ochre on upper side (darker distally), pale brown to ochre grey on underside; sensillae very fine, weakly visible. Thorax bright ochre, without dark scales. Forewing ochre, with blackish brown scales along costal margin and on apex; some blackish brown scales also along dorsum; all blackish brown scales are distinctly pale-tipped; underside of forewing fuscous; fringe blackish brown, distally pale brown. Hindwing very narrow, grey on upper side and underside, without spots or androconia; fringe blackish brown to grey brown. Legs ochre, except forelegs

which densely covered with blackish brown scales on upper side. Abdomen glossy, ochre to dark brown on upper side, ochre to fuscous on underside; anal plates fuscous, large.



FIGURES 7–13. *Paratischeria jingdongensis* Xu & Dai, *sp. nov.*, Yunnan Province, China. 7, adult, male, holotype; 8, same, female, paratype (allotype); 9, female genitalia, paratype (allotype), slide no. BH16009; 10, same, ovipositor lobes, apophyses and prela; 11, male genitalia, paratype, slide no. BX16020, phallus; 12, same, capsule; 13, same, holotype, slide no. BH16008 (GNU).

Female (Fig. 8). Forewing length: 2.9–3.4 mm; wingspan: 7.1–7.6 mm. Flagellum without visible sensillae. Forewing dark ochre, with blackish brown scales along costal margin and on apex; there are fewer blackish brown scales on tornus than in male; all blackish brown scales are distinctly pale-tipped; fringe blackish brown, pale distally. Hindwing grey. Abdomen blackish grey on upper side; anal tufts dark grey. Otherwise as in male.

Male genitalia (Figs 12, 13). Capsule 340–425 µm long, 180–335 µm wide. Uncus with two very large lateral lobes. Valva slender, without lobes, about 330–375 µm long, 40–55 µm wide. Transtilla absent. Anellus long, bifurcated caudally, mostly membranous but with two thickened, semi-rounded lobes laterally. Vinculum very short. Phallus about 395–410 µm long, distally with lateral lobes possessing tiny spines (Figs 11, 13).

Female genitalia (Figs 9, 10). Total length 1550–1800 µm. Abdominal apex widely rounded. Ovipositor with very large lobes clothed with short, stout and dark modified setae which we refer to as ‘peg setae’ (Fig. 10); second pair of ovipositor lobes two or three times smaller, bearing long setae. Anterior and posterior apophyses stout. Additionally, there are three pairs of rod-like projections (collectively referred to as prela by Braun 1972): two pairs of very slender processes and one pair of wide, stout processes. Vestibulum without antrum, fully membranous. Ductus bursae very long and slender, slightly wrinkled, without spines. Corpus bursae membranous, very small, about 480 µm long, 150 µm wide, without spines or signum. Ductus spermathecae probably lost in the dissection (Fig. 9).

Bionomics (Figs 2–6). Host plant: *Dalbergia assamica* Benth., Fabaceae (Leguminosae) (Fig. 4). Larvae mine leaves from late June to mid-August. Leaf-mine may locate in any part of the leaf; it is an irregular blotch with almost no frass, cream white to pale brown at the early stage of development (Figs 5, 6), but ochre or orange brown at the stage of pupa, with inconspicuous concentric dark brown arcs (Fig. 6). Nidus not apparent at the early stage but distinctive at the final stage of the mining. Pupation inside the leaf-mine without cocoon. Exit slit on upper side of the leaf. Adults known from August.

Distribution (Figs 38, 39). Known from a single locality in the Ailaoshan Mountains (China: Yunnan Province) at elevation about 1500 m, mostly along roadsides in the montane subtropical broadleaf evergreen forest (Figs 2, 3).

Etymology. The species is named after the region (Jingdong County, Yunnan Province) in reference to the species distribution.

***Paratischeria hestias* (Meyrick, 1915) comb. nov.**
(Figs 14–39)

Tischeria hestias Meyrick, 1915a: 354.

Material examined. VIETNAM: 1 ♂, 2 ♀, 140 km SW Hanoi, Mai Châu, 20°38'23"N, 105°05'25"E, elevation 200–700 m, pupae and feeding larvae in leaf-mines on *Helicteres viscida* Blume, 15–17.i.2017, field card no. 5235, J. R. Stonis, genitalia slide nos AD880♂, AD884♀ (LEU).

INDIA: 1 ♀ (holotype), Karwar, Kanara, pupa in leaf-mine on *Helicteres isora*, 12.viii.1913, R. Maxwell, genitalia slide no. 28682 (BMNH).

Diagnosis. In male genitalia, the combination of a specific anellus (Fig. 24) and a basally rounded phallus distinguishes *Paratischeria hestias* from all other Tischeriidae species. In the female genitalia, the ductus spermathecae with 15–16 large coils and strongly narrowed abdominal apex (Fig. 33) distinguish *P. hestias* from other studied congeneric species as well as all other representatives of the family. The host-plant genus *Helicteres* L. also makes this species distinctive.

Male (Figs 22, 23). Forewing length about 2.8 mm; wingspan about 6.2 mm. Head: face cream to brownish cream; palpi distinctly cream, with some dark brown scales laterally; frontal tuft comprised of wide lamellar scales, pale grey, distally cream; collar glossy, comprised of slender lamellar or almost piliform scales; most of the scales cream, some pale grey; antenna longer than half the length of forewing; flagellum with about 35 segments, pale grey with little purple iridescence; hair-like sensillae trichodea very fine, pale, rather indistinctive; pecten long, very distinctive, comprised of mostly dark brown scales. Thorax, tegula and forewing pale ochre with numerous black scales forming an irregular pattern (Fig. 23); fringe pale ochre to grey; underside of forewing grey, without androconia or spots except small, irregular scaleless patches at the base. Hindwing very slender, pale grey to grey, with very little purple iridescence; underside of hindwing grey, without androconia or spots; fringe pale grey to

grey. Legs brownish cream on underside, densely covered with black scales on upper side. Abdomen glossy, metallic grey on upper side and underside; genital segments grey on underside, brownish cream on upper side; anal tufts indistinctive.

Female (Figs 29, 30). Forewing length: 2.3 mm (holotype from India), 3.1 mm (specimen AD884 from Vietnam); wingspan 5.7 mm (holotype), 6.8 mm (specimen AD884). Head: face glossy, grey to pale brown; palpi distinctly cream; frontal tuft comprised of wide lamellar scales, pale grey to grey laterally, cream grey medially; collar comprised of cream grey and grey scales; antenna longer than half the length of forewing; flagellum with about 36–38 segments, grey and glossy; sensillae trichodea indistinctive (hardly visible); pecten long, very distinctive, comprised of dark brown scales. Thorax, tegula and forewing densely speckled with blackish grey and ochre brown scales; the latter mostly distributed in two longitudinal patches of the forewing (Fig. 30); fringe greyish cream to pale grey; underside of forewing pale grey, without spots except small, irregular scaleless patches at the base. Hindwing very slender, pale grey, with little purple iridescence; underside of hindwing pale grey, without spots; fringe pale grey. Legs ochre cream on underside, densely covered with grey brown to dark grey-brown scales on upper side.

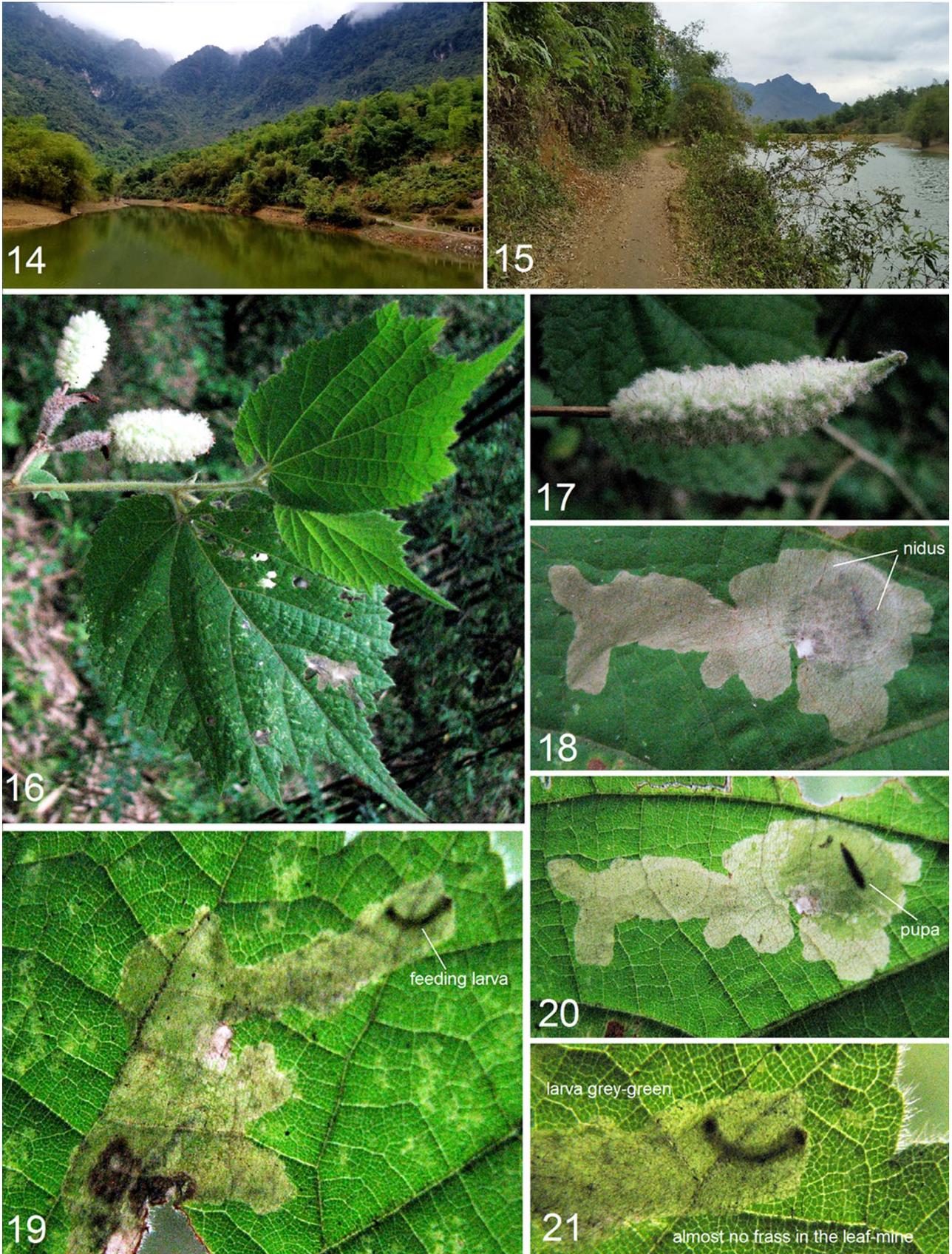
Male genitalia (Figs 24–28). Capsule about 345 µm long, 165 µm wide. Uncus with two slender and long lateral lobes; basally, uncus with a pair of distinctive setae (Fig. 27). Valva about 280–285 µm long; transtilla absent. Anellus (Fig. 24) elaborated. Vinculum triangular, widely rounded distally. Phallus (Figs 24, 26) about 220 µm long; in apical half, distinctly bifurcated, at the base, very wide and rounded.

Female genitalia (Figs 31–34). Abdominal apex and ovipositor narrow; ovipositor clothed with short, stout and dark modified setae which we refer to as ‘peg setae’ (Fig. 31); second pair of ovipositor lobes three times smaller, bearing long setae. Anterior and posterior apophyses slender (Figs 32, 33), 400–435 µm long. Additionally, there are three pairs of rod-like projections (collectively referred to as the prela by Braun 1972). Vestibulum membranous, without thickened sclerite or hardened plate (i.e. without antrum). Corpus bursae membranous, relatively very small and slender, without spines or signum. Ductus spermathecae with 15–16 very large coils (Fig. 34).

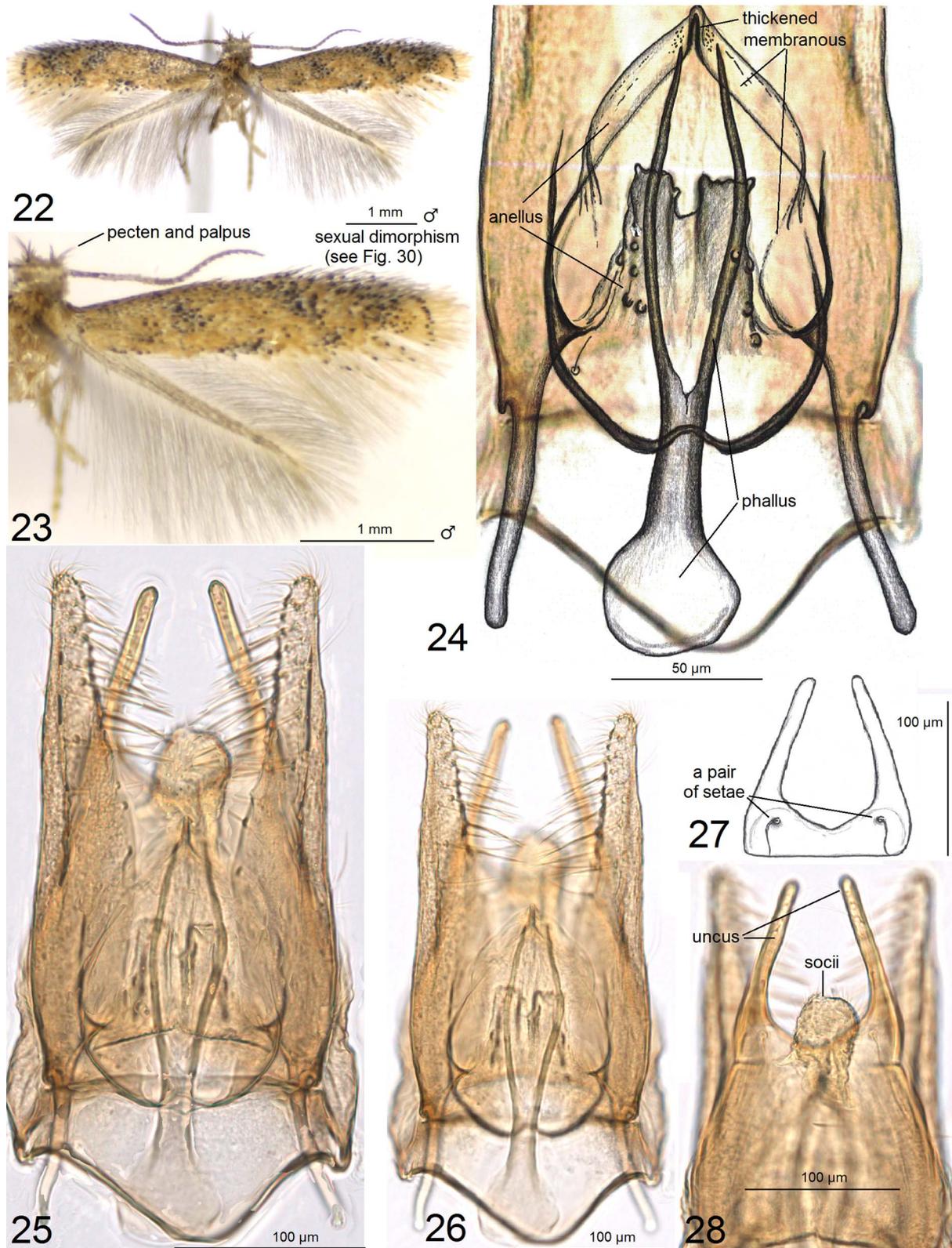
Bionomics (Figs 14–21). Host plants: *Helicteres viscida* Blume (Figs 16, 17) and *H. isora* L., Malvaceae (former Sterculiaceae). Larvae detected in January (northern Vietnam) and August (western India); however, it is possible that the mining season is much longer, with probably overlapping generations. In northern Vietnam during mid-January, about 20% of the observed leaf-mines of *Paratischeria hestias* were with feeding larvae, 20% with pupae and about 60% were empty (vacant), about 1–2 months old. Leaf-mine reminds an irregular blotch (Figs 18, 19), almost without frass. Larva grey-green (Fig. 21), with dark grey-brown intestine. Pupation inside the leaf-mine without cocoon; pupa black-brown (Fig. 20). Exit slit on upper side of the leaf. Adults known from February and August.

Distribution. Currently this species is known from two localities: western India (Meyrick’s holotype) and northern Vietnam (Figs 38, 39) from highly disturbed subtropical evergreen premontane forests (Figs 14, 15) at altitudes about 200–700 m. After the “Formula of determining of abundance and occurrence of leaf-miners” (see Diškus & Stonis 2012: 52–54), *P. hestias* is a very common species in Mai Châu, 140 km SW Hanoi; the distribution range of the host plants *Helicteres viscida* and *H. isora* (Fig. 38) allows us to assume that *P. hestias* may occur at least in many localities of northern Vietnam and north-eastern Laos.

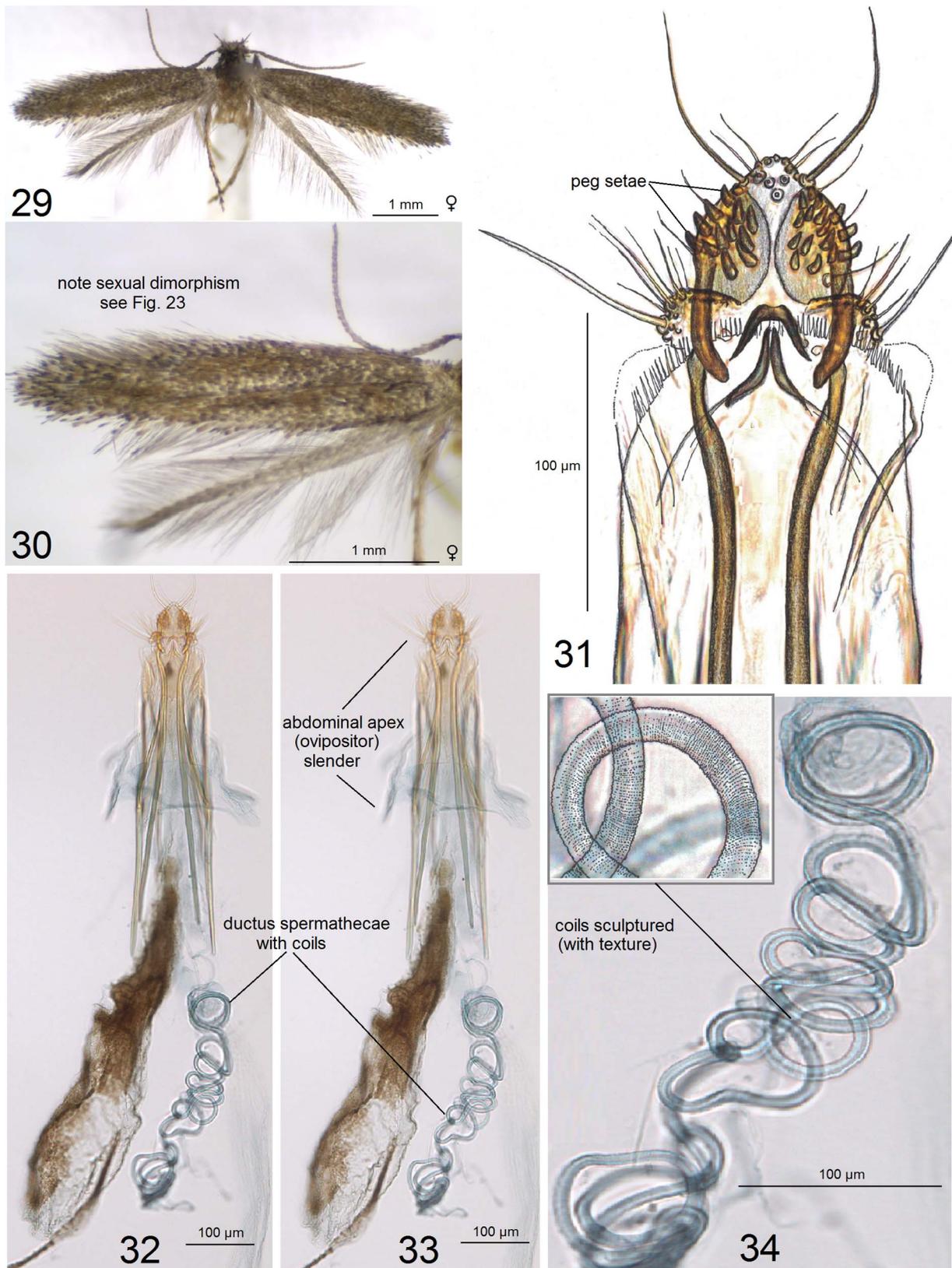
Remarks. Formerly *Paratischeria hestias* was a very little known species, the original description of which (Meyrick 1915a) was based on a single female specimen reared by R. Maxwell from a pupa within a leaf-mine on *Helicteres isora* in Kanara, western India (currently also known as Canara, Karavali or Coastal Karnataka, the southern part of the Konkan Coast). We compared the female holotype to our female specimen from northern Vietnam and no obvious differences were found. Despite the slightly larger size of the Vietnamese specimen, both compared females were very similar in other characters, e.g. the same distinctly cream palpi, similarly scaled face and frontal tuft, the same color of antenna and similar forewing pattern. Unfortunately, some parts of the female genitalia of the holotype (slide 28682 BMNH) have been lost during the process of dissection. However, judging from the fact that both compared female specimens possess very narrow abdominal apex, long apophyses (Figs 35, 36) and about 15–16 very large coils of ductus spermathecae (lost in the slide 28682 BMNH but sketched out in Fig. 37), we conclude that the female specimen from northern Vietnam and female holotype of *P. hestias* belong to the same species. In addition, the fact that both host plants are from the *Helicteres* genus allows us to assume that the compared specimens can be attributed to a single species.



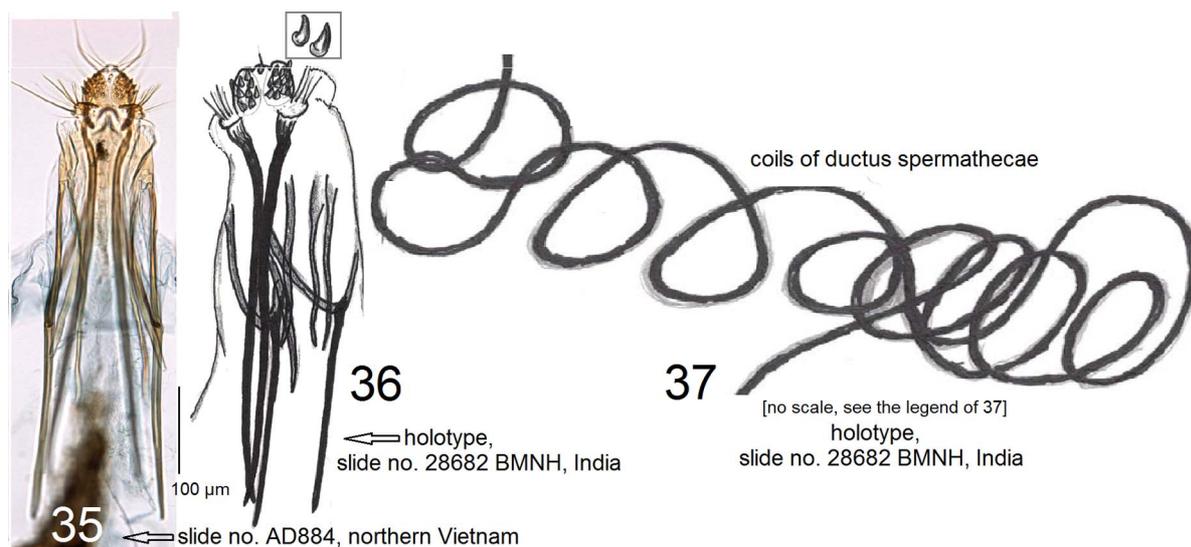
FIGURES 14–21. *Paratischeria hestias* (Meyrick, 1915) (**comb. nov.**), northern Vietnam. 14, 15, habitat, Mai Châu, 140 km SW Hanoi, elevation 200–700 m; 16, 17, host plant *Helicteres viscida* Blume, Malvaceae (former Sterculiaceae); 18–21, leaf-mines.



FIGURES 22–28. *Paratischeria hestias* (Meyrick, 1915) (**comb. nov.**), northern Vietnam. 22, 23, adult, male; 24, male genitalia, slide AD880, anellus and phallus; 25, 26, same, general view; 27, same, uncus; 28, same, uncus and socii (LEU).



FIGURES 29–34. *Paratischeria hestias* (Meyrick, 1915) (comb. nov.), northern Vietnam. 29, 30, adult, female; 31, female genitalia, slide no. AD884, abdominal apex; 32, 33, same, general view; 34, same, coils of ductus spermathecae (LEU).



FIGURES 35–37. Female genitalia of *Paratischeria hestias* (Meyrick, 1915) (**comb. nov.**). 35, northern Vietnam, female genitalia, apophyses and ovipositor lobes, slide AD884 (LEU); 36, Karwar, western India, Meyrick's holotype, slide no. 28682 (BMNH); 37, coils of ductus spermathecae, holotype, slide no. 28682 (BMNH), reconstruction (working sketch) because bursa and accessory sac have been lost at the final stage of the dissection; therefore, no scale available.

Discussion

Yunnan (China) and adjacent northern Vietnam are famous for their great general biodiversity (Puplesis 2002). However, despite high taxonomic diversity of potential host plants, no leaf-mining Tischeriidae have ever been recorded from Yunnan and adjacent northern Vietnam. During the recent years, some Tischeriidae material was collected in this extraordinary region. Consequent dissection and preliminary study of this material confirmed great taxonomic (species) diversity in the region. By coincidence, the first two species which we have prepared for documentation, appeared to belong to the recently described genus *Paratischeria* Diškus & Stonis.

Even at a glance, the male genitalia of representatives of this genus can be distinguished from other genera by an elaborated anellus and usually slender valvae. Initially, diagnostics of the genus was given along with the original description of *Paratischeria* (Stonis *et al.* 2017) and now it is presented in an updated scheme in Fig. 1 of this paper. Other tischeriid genera were extensively discussed by Diškus & Puplesis (2003).

In the male genitalia, *Paratischeria* differs from *Astrotischeria* by the undivided, usually slender valva (divided in *Astrotischeria*), long undivided uncus (usually short and divided in *Astrotischeria*), and the strongly though variously developed anellus; from *Coptotriche* it differs in the slender valva, well-developed anellus with lateral papillae and setae as well as absence of transtilla, the absence of spines on diaphragma, larger vinculum, and differently shaped phallus (usually not tulip-shaped as in *Coptotriche*); from *Tischeria* it differs by the absence of juxta, presence of strongly developed anellus (absent in *Tischeria*), and usually larger vinculum (Stonis *et al.* 2017).

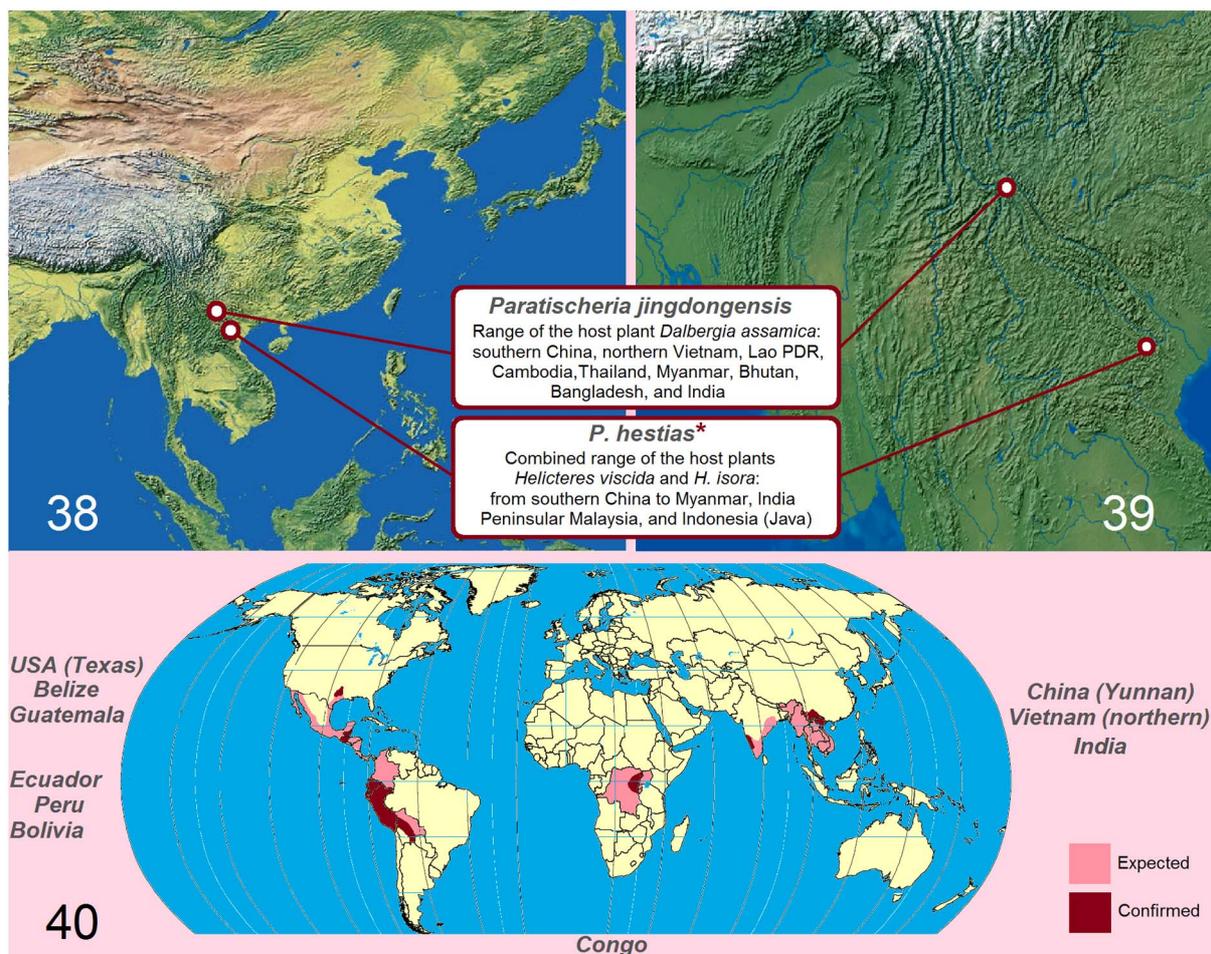
The *Paratischeria* genus can be supported by molecular data as well. According to the preliminary molecular research, at least four different lineages and two bigger clusters have been revealed within Tischeriidae; one of the lineages (see the Neighbor-Joining tree provided in Figs 73, 74 by Stonis *et al.* 2017) is represented by *Paratischeria*, a sister group of *Astrotischeria* Puplesis & Diškus.

Previously the *Paratischeria* genus was known from only the Neotropics (Central and tropical South America) and equatorial Africa (Congo). Now, after our discoveries in Yunnan (China) and adjacent northern Vietnam (Figs 38, 39), and study of holotype of *Paratischeria hestias* (Meyrick, 1915a) **comb. nov.**, the geographical range of *Paratischeria* was extended to tropical and subtropical Asia (Fig. 40).

Currently the genus comprises eight published species, including *Paratischeria heteroterae* (Frey & Boll, 1878) (**comb. nov.**) from Texas, USA. Except for *P. jingdongensis* **sp. nov.** and *P. capnota* (Meyrick, 1915b) (**comb. nov.**), all other described species can be attributed to two species groups: the *P. neotropicana* (designated here) and *P. ferruginea* (designated in Stonis *et al.* 2017).

The *neotropicana* group includes the American *P. neotropicana* Diškus & Stonis and *P. heteroterae*, and the Asiatic *P. hestias* (Meyrick, 1915a); the *ferruginea* group comprises the Andean *P. ferruginea* Diškus & Stonis and *P. fasciata* Diškus & Stonis, and the African *P. urticolella* (Ghesquière, 1940). However, there are numerous dissected but still undescribed new *Paratischeria* species from Guatemala, Ecuador, Peru, and other Neotropical countries (A. Diškus and J. R. Stonis, *pers. comm.*); most of them belong to the *P. neotropicana* species group.

As far as it is known, larvae of *Paratischeria* produce blotch-like mines in leaves. For the genus, the following four host-plant families are known: Fabaceae (reported here for the first time), Malvaceae (including former Sterculiaceae) (Diškus & Stonis 2015), Urticaceae (Puplesis & Diškus 2005, Stonis *et al.* 2017), and Asteraceae (Frey & Boll 1878, Meyrick, 1915b, also known from undescribed material, A. Diškus and J. R. Stonis, *pers. comm.*).



FIGURES 38–40. Distribution maps. 38, 39, new findings of *Paratischeria* spp. from Southeast and East Asia based on our material from China (Yunnan) and northern Vietnam (the natural range of the host plant *Dalbergia assamica* follows Chadburn 2012; the range of *Helicteres viscida* and *H. isora* follows Brink *et al.* 2016); 40, global distribution of the *Paratischeria* genus based on the following data: from USA, Texas: *P. heteroterae* (Frey & Boll, 1878) (**comb. nov.**); from Belize and Guatemala: *P. neotropicana* Diškus & Stonis, 2015, and some five dissected but still unpublished new species (Diškus & Stonis, *pers. comm.*); from Ecuador and Peru: *P. capnota* (Meyrick, 1915) (**comb. nov.**), *P. neotropicana* Diškus & Stonis, 2015, *P. ferruginea* Diškus & Stonis, 2017, and several dissected but still unpublished new species (Diškus & Stonis, *pers. comm.*); from Bolivia: *P. fasciata* Diškus & Stonis, 2017; from Congo: *P. urticolella* (Ghesquière, 1940) (new combination provided in Stonis *et al.* 2017); from India and northern Vietnam: *P. hestias* (Meyrick, 1915) (**comb. nov.**); from southern China (Yunnan): *P. jingdongensis* Xu & Dai, **sp. nov.** * *P. hestias* is also known from Karwar, western India (Meyrick 2015b), not shown in Figs 38, 39.

Acknowledgments

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