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A New Genus, *Parkiana* Cho, gen. nov. (Lepidoptera: Lecithoceridae) from Madagascar, with Descriptions of Two New Species

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ABSTRACT

A new genus *Parkiana* Cho, gen. nov., belonging to Torodorinae of Lecithoceridae, is described from Madagascar, with two new species: *P. matutinalis* Cho & Agassiz, sp. nov. and *P. andasibensis* Cho & Agassiz, sp. nov. Although superficially similar to *Thubdora* Park, 2018, some of their morphological characters, such as wing venation, are unique and the species of the genus are grouped apart from *Thubdora* in a preliminary phylogenetic analysis based on *COI* barcode sequences. In addition to the specific descriptions, adults and genitalia for the two new species are illustrated.

Keywords: Africa, *COI*, new genus, new species, taxonomy

INTRODUCTION

Faunal study for Lecithoceridae in Afrotropical Region has been poorly progressed as noted by Park et al. (2019) and Park and De Prins (2019), and the Afromoths site currently lists 133 species belonging to 22 genera for Lecithoceridae (De Prins and De Prins, 2019).

In case of Madagascar, the faunal study for the family Lecithoceridae was first initiated by Meyrick (1918), describing *Lecithocera acrosphales* Meyrick and *L. pyxinodes* Meyrick. Later 23 additional species of the family were described from Madagascar by Pierre Viette during 1954–1988 (Minet and Thiaucourt, 2018). Of them, four species were of the genus *Idiopteryx* Walsingham and all the rest were placed in *Lecithocera* Herrich-Shäffer by him. All the types of the family described by Viette during that time are deposited in the Muséum national d'Historie naturelle (MNHN), Paris, France. In a preliminary study on the types in MNHN, authors found that all the *Idiopteryx* species do not belong to Lecithoceridae and most of the *Lecithocera* species described by him need to be transferred to new genera or other related genera as new combinations. A revision for the type species of the family will be separately prepared in a forthcoming article. In the meantime, a new genus of the family is hereby described, based on the material from Madagascar.

The new genus, *Parkiana* Cho of Torodorinae, is characterized by the forewing very narrowly elongated with a unique venation apparently different from any known genera of the subfamily and the antenna with a creamy-white, median or distal part. The male genitalia are nearly not distinguishable from those of *Thubdora*, but the abdominal segments VII–VIII are not characteristically modified or lacking a pair of long hair-pencils.

MATERIALS AND METHODS

The present study is based on the material collected from Madagascar in 2016. Dissected genitalia were stained mainly with chlorazol-black and wings were stained using Double Stain (BioQuip Products, Inc., Compton, CA, USA). Both were slide-mounted in Euparal. The colour standard for the descriptions of adults mainly followed Kornerup and Wanscher (1978). All the types will be placed in the Natural History Museum (NHMUK) (formerly the British Museum of Natural History), London, UK.

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RESULTS

Description

***Parkiana* Cho, gen. nov.**

Type species: *Parkiana matutinalis* Cho & Agassiz, sp. nov.

The new genus is defined by the following: forewing very narrow, with wing venation different from any allied genera in Torodorinae, with R_2 and R_3 coincident, and with R_4 and R_5 stalked or R_5 absent; antenna longer than the forewing length, with flagellum simply thickened, flattened in basal 1/3, then creamy white, dark brown in apical 1/5; while in case of the 2nd species, the antenna is simply thickened in basal 3/5, then creamy white subapically.

Detailed diagnostic characteristics of the genus are as follows:

Head: Antenna longer than the forewing length; flagellum dark brown in basal 3/5, partially creamy white distally. Labial palpus with 2nd segment thickened; 3rd segment slender, much longer than the 2nd.

Thorax: Forewing elongate, very narrow, with shiny, dark-yellowish-brown ground color; venation with R_1 arising from near middle of cell, R_2 and R_3 coincident; R_4 and R_5 stalked or R_5 absent; M_1 remote from R_{4+5} or R_4 at base; M_2 close to M_3 at base; CuA_1 and CuA_2 stalked for basal 1/3; 1A + 2A forked near base; cell weakly closed. Hind wing slightly broader than forewing, dark brown; apex more or less obtuse; venation with either M_2 present, M_3 and CuA_1 coincident, or M_2 absent, M_3 and CuA_1 stalked; cell weakly closed before middle of wing; termen slightly concave medially; fringe concolorous with ground color.

Abdomen: Over all densely spinous on most dorsal tergites; segment VIII lacking modified sclerite.

Male genitalia: Similar to those of *Thubdora*, with elongated uncus, broadened apically; gnathos well-developed; valva elongate, costa concave medially; cucullus elongate, upturned, densely setose; juxta broad, shield-shaped, with latero-caudal processes; aedeagus stout, as long as valva.

Etymology. The genus name *Parkiana* is a patronym honoring our colleague and a prominent microlepidopterist, Dr. Kyu-tek Park, Korea.

***Parkiana matutinalis* Cho & Agassiz, sp. nov. (Figs. 1A–C, 2A–D)**

Type specimen. Holotype: male, Madagascar: Andasibe 960 m, 18°57′S, 48°25′E, 15–19 iv 2016, leg. D. Agassiz & K. Larsen, gen. slide no. CIS-7328, *COI* barcode CBNU130.

Diagnosis. The new species can be distinguished from *Thubdora* species by the elongate forewing with different venation by having R_2 and R_3 coincident and R_4 and R_5 stalked, but it is hardly distinguishable from the latter in genital characters. It can also be separated from the following new species, *Parkiana andasibensis* by the forewing venation with R_4 and R_5 stalked, the hindwing with M_2 present, and the male genitalia with narrower, more elongated cucullus. In a preliminary analysis using the *COI* barcode sequences of lecithocerid species, *P. matutinalis* is closely related with *P. andasibensis* (max. p-distance, 7.4%), together positioned away from *Thubdora* (min.–max. p-distances between *Parkiana* and *Thubdora*, 8.2–15.0%).

Description. Male (Fig. 1A–C). Forewing length 6.5 mm.

Head: Vertex dark brown with greenish hue. Antenna (Fig. 1B) slightly longer than forewing; flagellum dark brown, thickened with long hairs in basal 2/3, creamy white distally, then dark brown in distal 1/9. Labial palpus with 2nd segment thickened; 3rd segment slender, about 1.5 times longer than 2nd.

Thorax: Forewing slightly delated distally; ground color dark yellowish brown, with a narrow, orange-white, strongly oblique, short line at about apical 1/5 of costa, which strongly angled on vein R_4 and connected to indistinct postmedian line; costa slightly concave medially; apex more or less sharply produced; termen oblique, concave beyond apex; venation (Fig. 2A) with R_4 and R_5 stalked for basal 2/3; R_5 reaching termen beyond apex; 1A + 2A long-forked at base; cell weakly closed. Hind wing yellowish brown, slightly broader than forewing; costa slightly expanded anteriorly in basal half; apex produced; termen slightly concave; venation with M_1 separated from Rs near 2/3 the length of wing, M_2 present; M_3 and CuA_1 coincident; cell weakly closed before middle of wing. Hind tibia with iridescent light-blue scales dorso-medially and dorso-apically (Fig. 1C).

Abdomen (Fig. 2D): Spinous zones on tergites.

Male genitalia (Fig. 2B, C): Uncus elongate, dilated apically. Gnathos broad basally, gradually bent from basal 2/3, sharply pointed apically. Tegumen weakly sclerotized, deeply emarginated on anterior margin medially. Valva broad basally, then deeply concave on costa; ventral margin straight, distinctly notched between sacculus and cucullus; cucullus narrowly elongated, strongly upturned dorsally, with round apex, densely setous. Juxta shield-shaped, with heavily sclerotized, long caudal lobes, slightly bent inwardly; caudal margin slightly convex at middle. Aedeagus stout, curved in S-shape, nearly parallel-sided; cornuti consisting of a long series of conic spines, longer than twice the length of aedeagus.

Distribution. Madagascar.

Etymology. The specific name is derived from the Latin, *matutinus* (= of the morning) with Latin superlative ending, *-alis*.

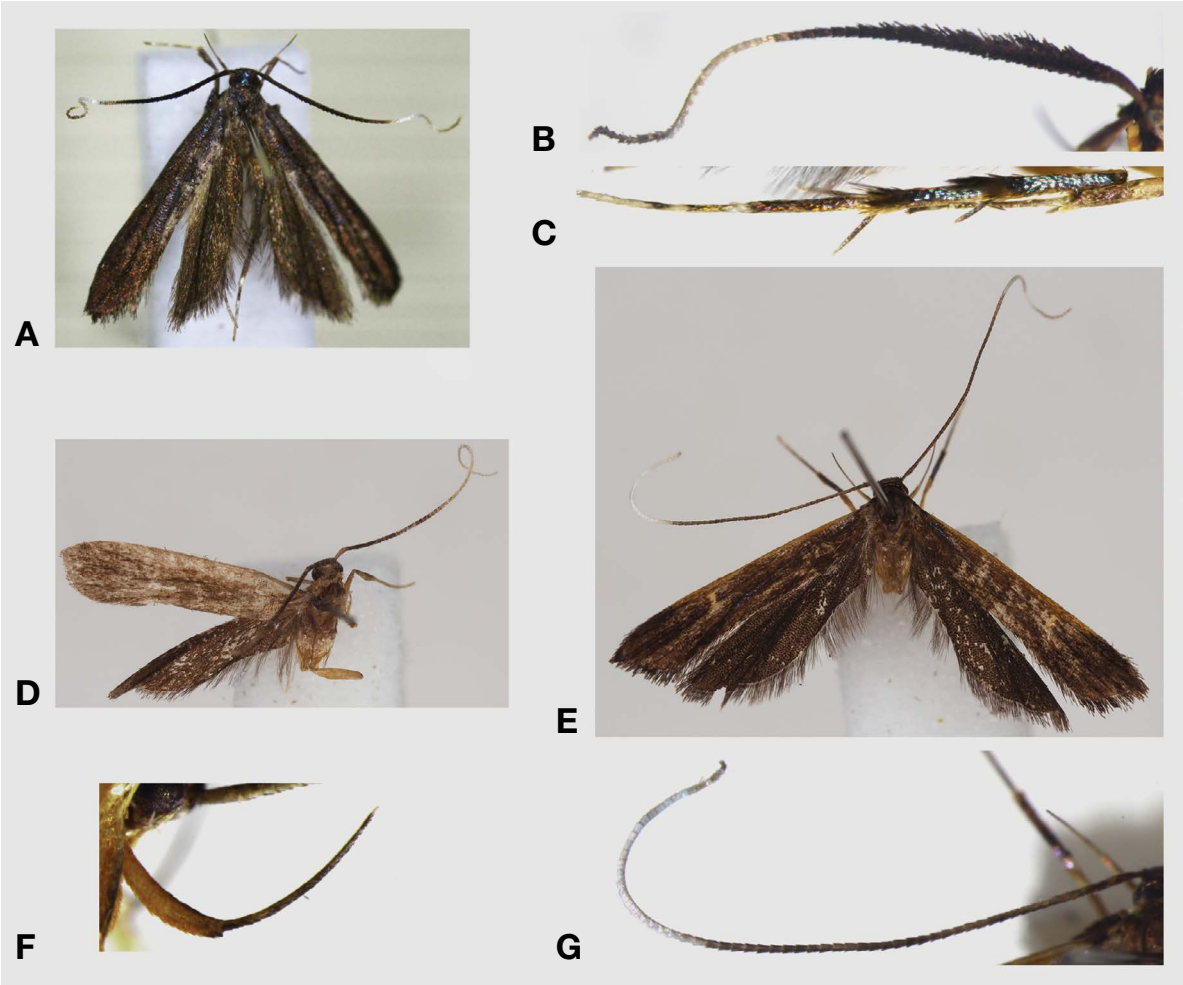

Fig. 1. Adults. A–C, *P. matutinalis* Cho & Agassiz, sp. nov.: A, Holotype, male (right wings later removed for wing slide); B, Antenna; C, Hind tibia. D–G, *Parkiana andasibensis* Cho & Agassiz, sp. nov.; D, Holotype, male; E, Paratype, female; F, Labial palpus of female, lateral view; G, Antenna of female.

Parkiana andasibensis Cho & Agassiz, sp. nov. (Figs. 1D–G, 3A–E)

Type. Holotype: male, Madagascar: Andasibe 960 m, 18°57′ S, 48°25′E, 15–19 iv 2016, leg. Agassiz & K Larsen, gen. slide no. CIS-7398, *COI* barcode CBNU-127. Paratype: female, same data as holotype, gen. slide no. CIS-7329, *COI* barcode CBNU-126.

Diagnosis. This new species can be distinguished from the preceding new species, *P. matutinalis* by wing venations of both wings: forewing with R_3 and R_4 coincident; hind wing with M_2 absent, M_3 and CuA_1 stalked. Abdomen has characteristically with a pair of short hair-pencils on each dorsal surface of 4th, 5th, and 7th segment laterally.

Description. Male and female. Forewing length, 6.5–7.5 mm.

Head: Vertex yellowish brown. Antenna (Fig. 1G) longer than forewing; flagellum dark brown in basal 3/5, creamy white in distal 2/5. Labial palpus (Fig. 1F) with 2nd segment thickened; 3rd segment slender, about 1.5 times longer than 2nd.

Thorax: Dark yellowish brown dorsally. Forewing dark yellowish brown, scattered with dark-brown scales; markings indistinct in male; costa strongly oblique beyond 3/4; venation (Fig. 3A) with R_4 reaching costa before apex; R_5 absent; fringe with narrow, orange-white basal line, dark brown beyond. Hind wing brownish grey, darker than forewing; apex obtuse; venation with M_2 absent; M_3 and CuA_1 stalked.

Abdomen (Fig. 3D): Over all densely spinous on most dorsal tergites, with a pair of short, hair-pencils on 4th, 5th, and 7th segment laterally.

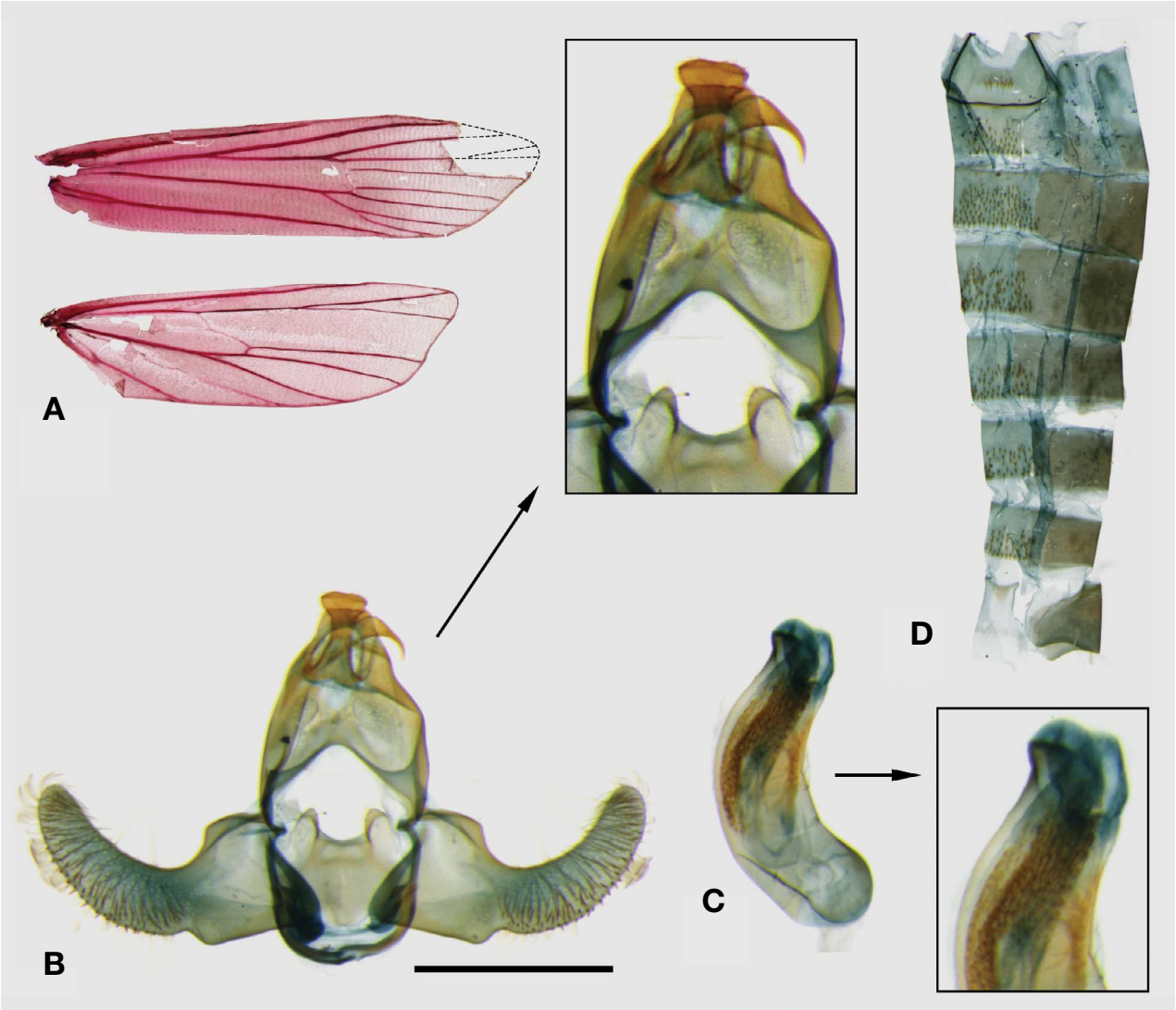

Fig. 2. Venation and genitalia of *Parkiana matutinalis* Cho & Agassiz, sp. nov.: A, Wing venation (right forewing horizontally flipped in actual slide); B, Male genitalia, holotype, gen. slide no. CIS-7328, with close-up of uncus + tegumen; C, Aedeagus, with close-up of distal part; D, Abdomen. Scale bar for genitalia = 0.5 mm.

Male genitalia (Fig. 3B, C): Uncus elongate, dilated apically; caudal margin nearly flat. Gnathos with median process broadened basally, nearly straight, bent downward apically. Tegumen weakly sclerotized, deeply emarginated on anterior margin medially. Valva broad basally; ventral margin nearly straight, notched between sacculus and cucullus; cucullus slightly narrowed toward apex, slightly upturned, densely setous. Juxta short, with heavily sclerotized, long caudal lobes, slightly bent inwardly; caudal margin slightly convex at middle. Aedeagus stout, broader than basal part of valva medially; longer than valva; cornuti consisting of two, long, linked series of conic spines, as long as 2/3 of aedeagus.

Female genitalia (Fig. 3E): Caudal margin of sternite VIII deeply emarginated. Antrum funnel-shaped, membranous. Ductus bursae narrowed posteriorly, broadly expanded and coiled medially, with numerous conic spines; ductus seminalis narrow, arsing from near middle. Corpus bursae large, ovate, with a small crescent signum posteriorly.

Distribution. Madagascar.

Etymology. The specific name is derived from the type locality, Andasibe.

DISCUSSION

The two new species described here are apparently within

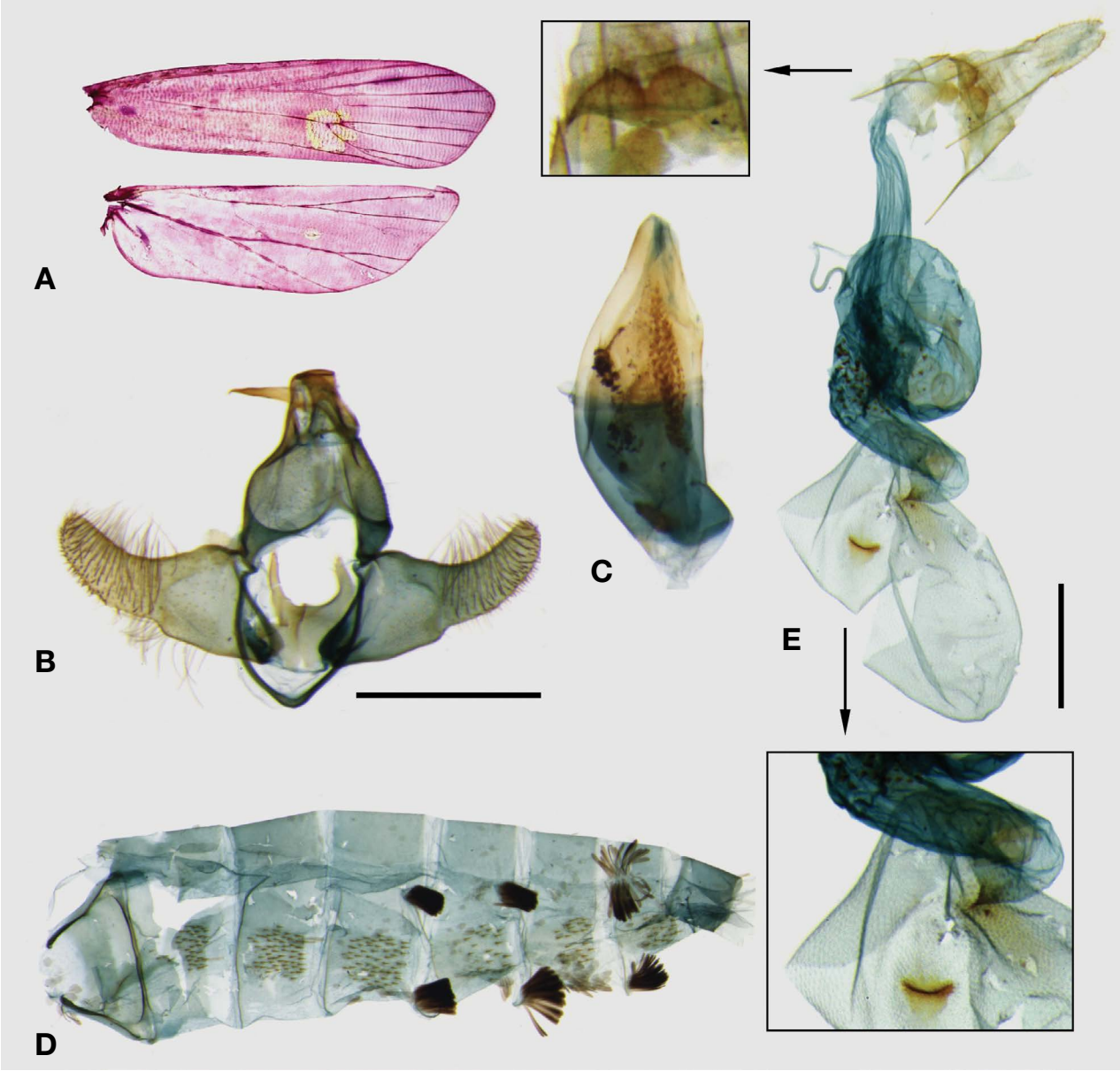

Fig. 3. Venation and genitalia of *Parkiana andasibensis* Cho & Agassiz, sp. nov.: A, Wing venation; B, Male genitalia, holotype, gen. slide no. CIS-7398; C, Aedeagus; D, Abdomen; E, Female genitalia, gen. slide no. CIS-7329, with close-ups of abdominal sternite VIII and signum. Scale bar for male and female genitalia = 0.5 mm.

the same genus as supported by morphological and molecular data. However, while the generic key for the family Lecithoceridae given by Gozmány (1978) was based mainly on wing venation, the venations of the two species seem to be somewhat different. Slight variations in wing venation may be a characteristic of the genus *Parkiana*, and we expect the characteristics of this new genus will become more obvious as we discover more species of the genus in the near future.

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CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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