THE GENUS PROSOPARIA IN NORTH AMERICA, WITH DESCRIPTION OF A NEW SPECIES FROM FLORIDA
(LEPIDOPTERA: NOCTUIDAE: BOLETIOBIINAE)

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ABSTRACT.—The North American species of the genus Prosoparia Grote are reviewed. Two species, Prosoparia perfusaria Grote, 1883 and P. anomalis (Barnes and Benjam in, 1912) occur in southwestern North America and a third species, Prosoparia floridana Lafontaine and Dickel n. sp., is described as a new species from Florida. Adults and genitalia are illustrated.

KEY WORDS: Arizona, Florida, Nearctic, Noctuoidea, North America, Prosoparia floridana n. sp., taxonomy, Texas.

The genus Prosoparia Grote is represented in the United States by three species, although previous to our study only one species was recognized in the US and 12 in Central and South America (Poole, 1989). None is known from the Caribbean. A very distinctive black species occurs in Florida and was treated by Kimball (1965) as Prosoparia perfusaria (Grote, 1883). In discussing the occurrence of P. perfusaria in Florida, Kimball (1965) makes the comment, based on observations from Fred Rininger at the American Museum of Natural History [AMNH], that the species becomes progressively larger and darker as it ranges from Texas across the Gulf States and into Florida. We have failed to find any material of Prosoparia, including material at AMNH, from eastern Texas or the other Gulf States, and find a marked break in color between the brown specimens from Arizona and western Texas and the black specimens from Florida. Extensive collecting in suitable habitat in eastern Texas and western Louisiana by Hugo Kons, Jr. and Robert Borth produced no specimens of Prosoparia despite surveys in habitats similar to those where the species occurs in northern Florida at the same time of year (Kons and Borth, pers. comm.). Also, Bordelon and Knudson (1999) did not report Prosoparia among the 1,743 species of Lepidoptera they reported from their survey of the Big Thicket National Preserve and surrounding areas in southeast Texas.

Antennal structure and molecular analysis of 688 base pairs of the cytochrome c oxidase 1 (CO1) mitochondrial gene support the recognition of three species of Prosoparia in North America, two in the American Southwest and one in Florida. The barcode difference between populations of P. perfusaria and P. anomalis in Arizona is 6.1% and that between populations of these two species and P. floridana n. sp. is 9.5-9.7%. Prosoparia floridana has six recorded haplotypes (two from Highlands Co. (6 specimens), three from Marion Co. (3 specimens), one of which is also in Liberty Co. (2 specimens), and one from Levy Co. (1 specimen)) with a maximum difference among them of 1.30%; P. perfusaria and P. anomalis each have two haplotypes recorded with differences between them of 0.35% and 0.24%, respectively. A phylogenetic analysis of these three species (and Prosoparia tenebrosa (Schaus) from Costa Rica), with Pseudorgia Harvey and Palpidia Dyar as outgroups, give bootstrap values for Prosoparia as 100%, for the Arizona + Costa Rican species clade as 94%, and P. perfusaria + P. anomalis as 62%.


The genus Prosoparia and the three North American species are diagnosed below.

PROSOPARIA Grote, 1883

Type species: Prosoparia perfusaria Grote, 1883.
Type species: Friesia anomalis Barnes and McDunnough, 1912, Can. Ent., 44: 18, fig. 1 (3-6).

Prosoparia is characterized by small size (forewing length 8.2-15.5 mm), short broad wings, drab coloration, antennal structure, and genital characters. It was originally proposed in the Geometridae, but was moved to the Noctuidae by Barnes and McDunnough (1912) when they synonymized Friesia anomalis with Prosoparia perfusaria (Barnes and McDunnough, 1912: 57).

Diagnosis.—Body vestiture of broad, flat scales. Dorsum of male antenna with lateral wing-like flange on each side overlapping bases of rami; flanges wider toward base of segment, so segment appears triangular when viewed dorsally; dorsum of antenna fully scaled; antenna bicapitate with rami on front (anterior side) of segment 4-5x as wide as apical (narrowest) width of segment; rami on back (posterior) side of segment 6-7x as wide as apical width of segment; bases of paired rami adjoined along anterior ventral midline; rami projecting ventrolaterally and forward with rami forming an acute angle below antennal shaft; rami sparsely covered with single or clustered setae; female antenna similar to male but lateral flanges smaller. Eye round. Haustellum (proboscis) vestigial. Labial palps elongated, bilaterally flattened, projecting anteriorly and slightly upward, apical segment 0.35-0.45x as long as middle segment and slightly down-turned (usual) or in same direction. Forewing venation quadridune (i.e., M2 adjacent to M3 at ventral apex of cell). Hindwing venation pseudequadrifine (i.e., M2/3 of distance down cell toward M3). Legs covered entirely with flat scales, setae on tarsi microscopic (no spiniform setae). Ear with tympanal sclerite thread-like; alula and hood vestigial. Abdomen without accessory brushes; a pair of dorsolateral tuft of long scales projects posteriorly over the genitalia in male; female with four tufts, two dorsolateral tufts mostly fused and two lateral tufts; tufts on left side shorter than those on right in female. Male genital capsule a simple ring, wider dorsally on tegumen; uncus bilaterally flattened, enlarged gradually widening subapically with small spine at ventral apex projecting perpendicular to uncus; anal tube membranous except for lightly sclerotized scaphium; anellus densely sculptured, often tearing off around apex of aedeagus in preparation to form speculated band around aedeagus; valves symmetrical and unarmored, tapered from base to apex, costal and ventral parts of valves more heavily sclerotized than central part; aedeagus expanding from base to apex with ventral margin convex or slightly concave anteriorly; vesica a simple tapered tube about 1.2x as long as aedeagus. Female
genitalia with anal papillae covered long setae; outer margin of anal papillae deeply concave with dorsal posterior extension of outer margin longer than ventral posterior extension; abdominal segment VIII a narrow ring; anterior apophyses broad posteriorly; tapering to rod-like anterior 1/4; posterior apophyses about as long as anal papillae, narrower than anterior apophyses with anterior 1/2 rod-like; corpus bursae elongate, rounded anteriorly with small appendix bursae on left; corpus bursae without spines or sina; ductus bursae short and narrow.

Prosoparia was included in the Rivulinae by Fraenclmont and Todd (1983) next to Parascoria Hübn and Mycterophora Halst, probably because of the geometrical appearance. Prosoparia, Parascoria, and Mycterophora were moved to the Boletobinae by Fibiger and Lafontaine (2005) and we leave it there pending the discovery of the larval and phylogenetic analysis.

Prosoparia perfuscaria Grote, 1883
(Fig. 1, 2, 7)

Prosoparia perfuscaria Grote, 1883:130.
Type locality: Arizona (USNM, Washington)

Prosoparia perfuscaria is characterized by the brown to dark-brown forewing speckled with yellow-brown scales and with the maculation obscure. Transverse lines, when present, appear diffused by the background scales. Forewing length is 10-11 mm (males) and 10-12 mm (females). In the male antenna the maximum width of the antenna (anterior + posterior rami) is 10-11 mm as wide as the anterior width of the central shaft (6-7 mm as wide in female). The genitalia are generally as described for the genus; the male valve is abruptly tapered at 1/3 of the distance from the apex and the ventral margin of the adeagus is convex.

Prosoparia perfuscaria occurs in southeastern Arizona (Coconino Co. [Huachuca Mts.], Pima Co. [Brown Canyon, Baboquivari Mts.]) and western and central Texas (Brewster Co. [Chisos Mts.], Culberson Co. [Guadalupe Mts.], Jeff Davis Co. [Davis Mts.], Kimble Co. [Junction]). It has not yet been found in New Mexico. The Texas Lepidoptera survey has published distributional records and phytology for the Guadalupe Mountains, Chisos Mountains, and Davis Mountains (Knudson and Bordelon, 1999a, 1999b, 2000).

Hugo Kons and Robert Borth collected it in the Davis Mountains (Davis Mountains State Park primitive area and a picnic area on TX Hwy 17) along Limpia Canyon, a canyon with cypress woods, pecan, oak, and hackberry surrounded by desert grassland at 4,514 to 4,915'.
(H. Kons, pers. comm.)

Adults have been collected from early May to mid-October, with a break between mid-July and mid-August.

Prosoparia anomalis (Barnes and McDunnough, 1912), revised status
(Fig. 3, 4, 8)

Friesia anomalis Barnes and McDunnough, 1912, Can. Ent., 44:18, fig. 1 (3-6).
Type locality: Redington, Arizona (USNM, Washington)

Note: The name is based on illustrations of the wing venation, foreleg and male antenna of the holotype male in USNM. The name was synonymized with Prosoparia perfuscaria by Barnes and McDunnough (1912: 57), so a formal description was never published.

Prosoparia anomalis is smaller than P. perfuscaria (forewing length 8-9 mm (males), 10 mm (one female)), the transverse lines are more sharply defined in black, usually with yellow shading distal to the pm line, and there is a series of yellow dots at the base of the forewing frill. In the male the maximum width of the antenna (anterior + posterior rami) is 7-8 x as wide as the anterior width of the central shaft (5 x as wide in the female). The genitalia are indistinguishable from those of P. perfuscaria. The DNA barcode of the single P. anomalis analyzed is 6.1% different from those of two P. perfuscaria, further supporting the status of P. anomalis as a separate species.

Prosoparia anomalis is known only from southeastern Arizona (Cochise Co. [Huachuca Mts.], Pima Co. [Tucson, Black Dove, Sierra Vista, Brown Canyon, Baboquivari Mts.], Pinal Co. [Oracle]). Adults have been collected in April, June, and from late July until early September.

Prosoparia floridana Lafontaine and Dicke, new species
Fig. 5, 6, 9, 10

Prosoparia floridana can be recognized by the black wing color with the maculation defined by fine white or pale tan speckling, the longer antennal rami, the more evenly tapered valve and shape of the adeagus in the male genitalia, and by the barcode.

Description—Male antenna: maximum width of antenna (anterior + posterior rami) 12-14 mm as wide as anterior width of central shaft (9-10x as wide in female). Apical segment of labial palpus averaging 0.43x as long as second segment in P. floridana (range 0.42-0.45x, 10 specimens), versus 0.40x as long in P. perfuscaria (range 0.35-0.44x, 10 specimens). Males smaller than females (forewing length: 11-12 mm, males; 12-15 mm, females). Forewing color brown, very lightly speckled with brown. Antennal and postmedial lines only partially indicated by white or light tan spots; reniform spot a narrow slightly curved white bar; some specimens with minute white dots on wing margins at ends of veins. Hindwing black with postmedial line partially indicated in some specimens. genitalia generally as described for genus; male valve more evenly tapered and more broadly rounded apex, and anterior-ventral margin of adeagus slightly concave, not evenly convex as in P. perfuscaria and P. anomalis.


Adults have been collected from early May to mid-October, with a break between mid-July and mid-August.
Fig. 7-10) Protoporia genitalia. 7) P. perfuscaria, ♀ genitalia, USA, Arizona, Pima Co., Bañoquivari Mts. 8) P. anomalus, ♀ genitalia, USA, Arizona, Pima Co., Bañoquivari Mts. 9) P. floridana, ♂ genitalia, USA, Florida, Levy Co., Goethe State Forest, N Gasline Road. 10) P. floridana, ♀ genitalia. USA, Florida, Marion Co., Ocala National Forest.
where the soil is alkaline and ericaceous plants are absent has not produced a single specimen in spite of more than 10 years of almost continuous collecting. Adults have been collected from late April until mid-September.

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