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A NEW SPECIES OF *PLATAEA* (GEOMETRIDAE: ENNOMINAE) FROM SOUTHEASTERN ARIZONA

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ABSTRACT. *Plataea polychroma* Ferris & McFarland is described from seven wild caught females and six reared adults of both sexes from Cochise Co., Arizona. The early stages, adults of both sexes and genitalia are figured.

Additional key words: Arizona, Ennominae, Geometridae, *Plataea polychroma, Salvia* species.

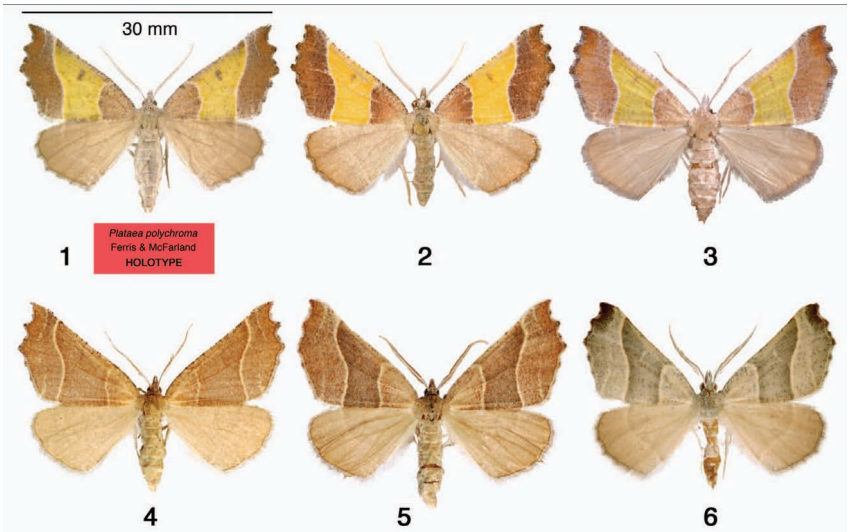
In his revision of the genus *Plataea*, Rindge (1976) recognized eight species, six from western North America, and two from Mexico. Subsequently Knudson (1986) described a ninth species from Texas. Although the genitalia vary widely in *Plataea*, Rindge made his generic assignment based upon adult external morphology. Future DNA analysis may require a revision and reassessment of the genus. The species that we describe here meets Rindge's criteria in all respects.

Plataea polychroma Ferris & McFarland, **new species**
(Figs. 1–19)

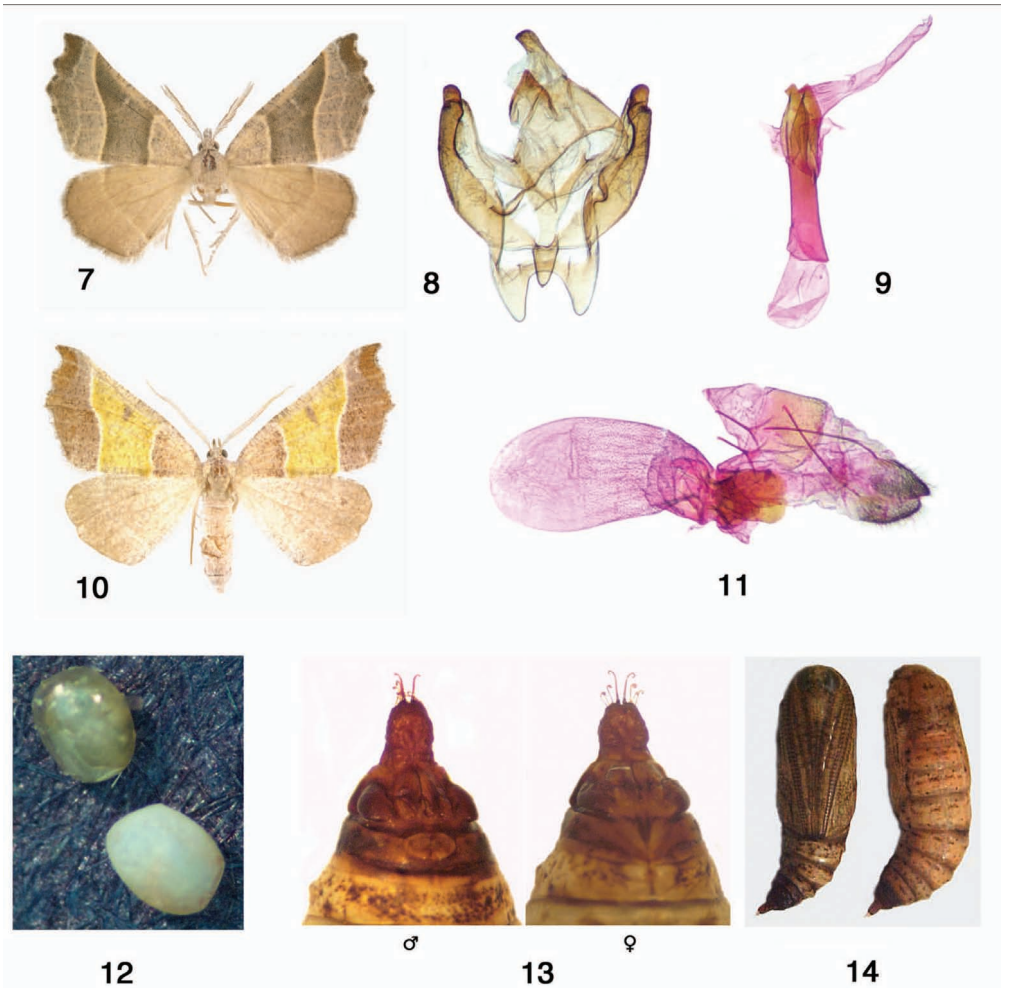
Diagnosis: The broad separation between the nearly parallel dorsal forewing (DFW) antemedian and postmedian lines distinguishes *Plataea polychroma* from its congeners. The gray-olive-green male DFW median band wing color with paler basal and outer marginal areas is similar to *P. blanchardaria* Knudson. Females are immediately separated by their normally yellow median band and brown-violaceous basal and outer marginal areas.

Description: *Head*: Front flat, covered by anteroventrally directed elongate whitish-gray scales sparsely speckled with brown, heavier in female; tongue present; labial palpi whitish-gray speckled lightly with brown in male, more heavily in female, porrect, extending slightly over one eye diameter beyond front; eye large; antennae bipectinate, pectinations in male vary from approximately 5× segment length at mid-shaft to segment length at apex; pectinations in female vary from approximately 3.5× segment length at mid-shaft to segment length at apex; pectinations and shaft whitish-gray lightly speckled with brown. *Thorax.* Dorsal ridge absent in male; scales whitish-gray sparsely brown speckled in male, more heavily speckled in female; legs clothed with whitish-gray scales sparsely speckled with brown. Epiphysis arising at middle of foretibia extends sightly beyond tibio-tarsal joint. Midtibia with one pair of spurs, hindtibia with two pairs of spurs. *Abdomen*: Above and below whitish-gray sparsely speckled with brown, more heavily so in female. Wings (sexually dimorphic): Males (Figs. 6–9). Forewing ground color "dirty white"; basal area lightly overscaled in gray; antemedian (AM) postmedian (PM), and subterminal (ST) lines same as ground color; AM line nearly straight bending basad at costa, PM line slightly concave at mid-wing, ST line originating at tornus slightly crenulate and nearly parallel to PM line with PM-ST interspace narrowing toward costa. Median band between AM and PM lines, submarginal area, and fringe checkering, grayish olive green; median band pale along costa, with a small pale discal spot. Area between PM and ST lines heavily overlaid with gray scales and speckled with darker gray scales. Apex falcate; outer margin convex and slightly crenulate. Fringe checkered with tips of cilia whitish. Hindwing tan; indistinct pale median line with small terminal dark inward patches. Fringe weakly checkered with scales basally dark and whitish distally. Underside tan with forewing sightly darker than hindwing. AM, PM and hindwing median lines weakly reproduced. Females (Figs. 1–5, 10–11). General pattern and wing shape same as male. Basal area, PM-ST interspace and subterminal regions with brown and violaceous scales. Apical region with orange overscaling. AM-PM band yellow with violaceous comma-shaped discal spot. Fringe checkered with brown and whitish scales. In two reared females, the yellow median band was replaced by tan (Figs. 4–5). Hindwing as in males, but paler. Underside similar to male, but with violaceous tint and the forewing apical area darkened. Length of forewings: males: n = 2, 14.5 cm.; females: n = 6, 15.0–16.0 cm. *Male genitalia*: Uncus heavily sclerotized with widely spaced short setae dorsally, projects ventrally with tapering tip, resembling a turtle's head when viewed laterally. Gnathos triangular, well sclerotized along lateral margins, broad at base tapering evenly to the tip. Valvae heavily sclerotized, broadly fused to juxta and saccus, with ventral margin folded over and apical thumb-like projection; medially invaginate saccus with broad rounded lobes; costa tapers posteriorly to a rounded point; juxta broadly y-shaped. Aedeagus heavily sclerotized and posteriorly bifid for one-half its length, each cusp medially expanded and then terminating in a modified arrowhead; membranous everted vesica tapers evenly without lobes or armament. Abdominal segment VIII unmodified and simple. *Female genitalia*: Papillae anales membranous, broad, covered with long and short slender setae, length of posterior apophyses approximately 3× anterior apophyses; sterigma a short broad tube, lamella antevaginalis sclerotized with broadly pointed margin, lamella postvaginalis plate-like with medially indented margin. Ductus bursae short and moderately sclerotized. Ductus seminalis arises at junction of ductus bursae and corpus bursae. Membrane of elongate corpus bursae covered uniformly, excepting the fundus, with very small conical chitinized projections.

Variation. No appreciable variation was observed in the two reared males. Substantial variation is seen in the females. Five of



FIGS. 1–6. *Plataea polychroma* adults. **1,** ♀ holotype; **2,** wild caught ♀ from type locality, 16.viii.08; **3,** ♀ emerged 17.x.08; **4,** ♀ emerged 7.1.09; **5,** ♀ emerged 3.iii.09; **6,** ♂ emerged 17.x.08.



FIGS. 7–14. *Plataea polychroma*. 7–9 male: **7,** adult emerged 18.x.08 (antennal tips are broken off); **8,** genitalia, aedeagus removed; **9,** aedeagus with vesica everted. **10–11,** female: **10,** wild caught adult 18.viii.08; **11,** genitalia. **12,** eggs, unhatched top, hatched bottom. **13,** pupal cremasters. **14,** ventral and dorsal pupa, 12.x.08.

the wild caught and two of the reared adult females are generally similar with a yellow median band and brownish-violet dark areas. The size of the forewing discal spot varies, as does the curvature of the AM line (Figs. 1–3, 10), and the width of the median band. In one wild caught female the bright yellow color of the median band is replaced by yellowish-tan, and by brownish-tan in two reared females (Figs. 4–5). It is unknown if the extreme color shift in these latter two individuals is natural, or perhaps a result of captive conditions and their ectopic emergence.

Types. Holotype (Fig. 1): ♀ emerged 27 October, 2008, reared from egg from wild caught ♀ paratype 18 August, 2008. Type locality: Arizona, Cochise Co., Mule Mts., 5500' (1675m) 31° 26.4' N, 109° 55.1' W, near Bisbee. The holotype is deposited in the American Museum of Natural History, New York, NY. Paratypes: 2 ♂♂ , emerged 17.x.08, 18.x.08 (latter specimen in Ferris collection); 3 reared ♀♀ : emerged 17.x.08 (normal color), 7.i.09 (tan), 3.iii.09 (tan); wild caught from type locality, 16.viii.08 (1♀), 18.viii.08 (1♀) in Ferris collection; wild caught: Arizona, Santa Cruz Co., Peña Blanca, 19.vii.01 (1♀), in J. Vargo collection; 4♀ ♀ in J. B. Walsh collection, Arizona, Santa Cruz Co., Peña Blanca Canyon, 3900' (1190m), 26.vii.02, 24.vii.04, 15.vii.06, 25.vii.08. The remaining material is in the McFarland collection. We have selected a typical female for the holotype, since to date, only females have been seen and collected in the wild.

Biology. A gravid female, attracted to UV light, was captured by Larry Prevett in Bisbee (5500', 1675m), Arizona on the night of 18 August, 2008 and placed in a small jar that was refrigerated for a week until the moth could be delivered to McFarland. Upon delivery, the moth was offered a honey–water solution (1/3 honey : 2/3 water) to maintain its vigor during potential oviposition. The observed tongue was short and small, but functional. The moth was placed in an empty small jar in which it readily deposited 67 eggs during the next several nights, all of which were securely glued to the glass at the bottom of the jar. The moth was preserved and is illustrated in Figs. 10–11. The eggs (Fig. 12) are unusually plain, with just a slight uniform light surface pebbling visible only under high magnification.

Prior experience in rearing *Plataea blanchardaria* on a woody *Salvia* sp. in Uvalde Co., Texas suggested trying a local *Salvia* as a larval host. Blue Sage (Shrubby Sage) *Salvia pinguifolia* (Fernald) Wooton & Standley [Lamiaceae], is a shrubby perennial that grows to a height of 2 feet (0.61 m) and sometimes up to nearly 6 feet (1.8 m) on certain rocky slopes and hills in the Bisbee area (Fig. 19). The flowers (July–September) are a deep blue; calyx lavender; foliage is a distinctive pale grayish-green and velvety in appearance, with a densely-matted pubescence, especially on the undersides of the leaves.

Upon emergence, in addition to *Salvia pinguifolia*, nine other non-native woody species were offered to the larvae [*Salvia chamedroides, clevelandii, darcyi, greggii, lemonii, leucantha*, *microphylla*, *muelleri*, *serpyllifolia*, and one *Agastache* sp.]. A few larvae nibbled on *S. clevelandii*, but eventually all converged on *S. pinguifolia*. Several larval instars are illustrated in Figs. 15–18. Unfortunately detailed records were not kept of the number of days in each of the five instars.

On 17 September, 2008, McFarland and Prevett visited a colony of *S. pinguifolia* in the Mule Mts. 6800' (2075m) elevation near Bisbee. Careful searching of the plants yielded six wild larvae that were identical to those being reared. The field-collected larvae were found at rest (motionless and outstretched) against the woody pale grayish-brownish foodplant stems, near or just below areas of feeding. The larvae are superb mimics of the woody stems of the host plant, and are presumed to feed at night, while remaining quiescent and stretched out along stems and twiglets during the day.

In the wild, the first and second instar larvae probably remain in the host plant leaves. They readily drop on silk lines if touched. High looping locomotion is accompanied by much wavering and tapping of the substrate by the forebody, as the small larva proceeds forward. By last instar, locomotion is more direct with less wavering.

Captive individuals pupated amongst the dry leaves in the bottom of the rearing container (a large, gallon-sized plastic jar). A well ventilated netting–like cocoon of relatively tough whitish silk, was formed between curled leaves, this would presumably translate to leaf litter beneath the shrubs in the habitat. Sheltered locations between curled leaves were selected, and all openings were closed off by a lattice-work of net-like silk, through which the pupa could be readily seen. None chose to burrow down into the soil that was provided beneath the layer of dry leaves, nor was any nearby soil incorporated into the silk during cocoon construction. Figs. 13–14 illustrate the the brownish-tan pupae, which are matte (not shiny).

Four adults (2♂♂, 2♀♀) emerged between 16–27 October, 2008, a third female on 7 January, 2009, a fourth female on 3 March, 2009. These ectopic emergences are considered a result of the captive environment. One deformed pupa died. Based on the growth patterns of the larval host, we suspect that the moth has just one annual generation with adult emergence in mid-July into August.

Distribution. Southeastern Arizona in Cochise and Santa Cruz counties. The larval host grows across southern New Mexico (Ivey, 2008) and into west Texas at elevations from 3500–6000 ft. (1070–1830m), and it is possible that the moth will subsequently be collected in this region.

Etymology. We have selected the name *polychroma* (adjective) to represent both the color differences between the two sexes, and the color variation in the adult females.

FIGS. 15-19. Larvae and host. **15–18** larvae. **15,** early instar showing lateral dark dashes; **16,** resting maturing larva, 23 mm, mimicking host plant stem, 26.ix.08; 1**7–18,** last instar, 40 mm, 26.ix.08; **19,** larval host *Salvia pinguifolia*, inset at left shows close-up of the flowers and leaves.

Remarks. Based on the male and female genitalia, the affinity of *Plataea polychroma* is close to *P. blanchardaria*. The larval host of *P. blanchardaria* is *Salvia* sp. (reared by McFarland in Uvalde Co., Texas). The females of *P. polychroma* bear some superficial resemblance to females in certain species of *Lychnosea*, *Sicya*, and *Pherne* (figs. 4–5), but the genitalia immediately remove any confusion as to generic placement. The species appears to be uncommon and locally distributed. Unrecognized and uncurated additional specimens may reside in collections.

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