

# Subtle Satyrs: differentiation and distribution of the newly described *Hermeuptychia intricata* in the Southeastern United States (Lepidoptera: Nymphalidae: Satyrinae)

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*Hermeuptychia intricata* Grishin (Intricate Satyr) was recently described from the southeastern United States (Cong & Grishin 2014), as a new cryptic species formerly overlooked within sympatric *H. sosybius* (Fabricius, 1793) (Carolina Satyr). The new species was diagnosed based on differences in the male and female genitalia between it and *H. sosybius*, as well as differences in the COI DNA 'barcode' between the two species. The most obvious diagnostic character in male genitalia is the shape of the distal part of the uncus. It is pointed in *H. intricata* (Fig. 1j) and looks truncated in *H. sosybius* (Fig. 1k). In female *H. intricata*, the antrum is smaller, darker, and more triangular (V-shaped, Fig. 1l), but is larger, paler, and rounder in *H. sosybius* (U-shaped, Fig. 1m). While these genitalic characters are rather external, and can usually be observed without complete dissection upon brushing the tip of the abdomen, it would be desirable to find characters that allow unambiguous identification of live individuals, including those readily seen in photographs. A discussion of possible diagnostic characters on the ventral side of *H. intricata* was provided in the original description, but the authors concluded that they "were not able to find reliable wing pattern characters to tell the difference between the two species" (Cong & Grishin 2014).

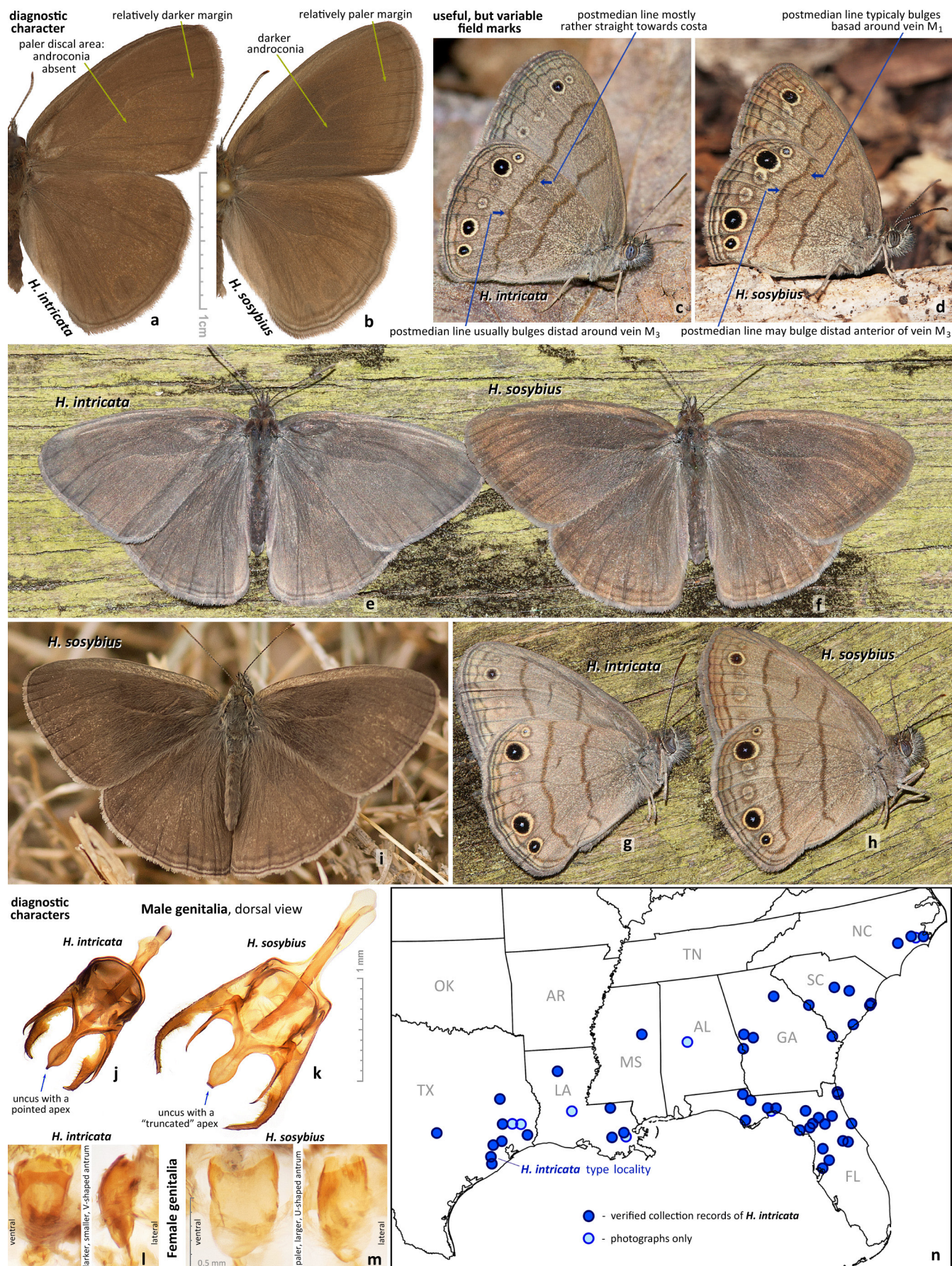
Shortly after the publication of the original description of *H. intricata*, we realized that the dorsal surface of the male wings does, in fact, include a diagnostic character that readily separates that species from *H. sosybius*. The basal two thirds of the forewing (and a region in and near the discal cell of the hindwing) of *H. sosybius* is covered with a layer of dark androconial scales (which under magnification appear markedly more elongate and dense than surrounding scales), leaving the outer third of the forewing distinctly paler than the darker base (Fig. 1b, f, i). Males of *H. intricata*, on the other hand, completely lack the dark androconia above, resulting in a nearly uniformly-colored dorsal surface (Fig. 1a, e). In some cases, the outer margin and cell of the forewing may even be slightly darker than basal areas - essentially the reverse of the pattern seen on *H. sosybius*. While subtle, this difference is easily observed in photos, as well as pinned specimens

(Fig. 1a, b) and live individuals (Fig. 1i), as long as they are not too damaged. We haven't yet noticed any diagnostic characters on the dorsal sides of female *Hermeuptychia* that readily separate the two species.

In addition to the presence or absence of dark forewing androconia on males, there are other subtle differences that are sometimes useful in separating *H. intricata* from *H. sosybius*, including females, some of which were discussed (p. 84) in the original description of *H. intricata*. While not always diagnostic, the postmedian line on the ventral hindwing of most specimens of *H. sosybius* bulges basad around vein M1 (basad of the large eyespot near the apex, Fig. 1d, h), while on *H. intricata* this region of the postmedian line is usually straighter (Fig. 1c, g). On *H. intricata*, the ventral hindwing postmedian line frequently bulges distad around vein M3 (basad between the two smaller eyespots, Fig. 1c, g), but it rarely does in *H. sosybius* (Fig. 1d, h). The bend in the ventral forewing postmedian line, discussed in the original description of *H. intricata*, seems too variable between the two species to be very useful in separating them. While difficult to quantify, the forewing of *H. intricata* appears to be slightly longer near the apex than that of *H. sosybius*, which has a somewhat more rounded forewing apex. As a result, some individuals of *H. intricata* have a shallowly concave outer margin to the forewing, a feature rarely seen on *H. sosybius*. Finally, very fresh specimens of *H. intricata* and *H. sosybius* may differ subtly in their overall coloration. As shown in Fig 1e-h, fresh individuals of *H. sosybius* usually have an overall warm brown tone, above and below, while those of *H. intricata* have a colder gray tone. Once the butterflies have flown for a day or two, these color differences are no longer apparent. Both *H. intricata* and *H. sosybius* are seasonally variable; spring adults of both are generally larger, with smaller eyespots below, while summer adults are usually smaller, with larger eyespots below.

Once the presence or absence of dorsal forewing androconia had been identified as a diagnostic character on males, and confirmed through genitalic dissections, males of *H. intricata* were easily found among series of *H. sosybius*







in the collections at the McGuire Center for Lepidoptera and Biodiversity (MGCL), as well as other collections and online images (to be detailed in another publication), thus providing an opportunity to further refine the overall geographic range of *H. intricata*. The original description cited specimens of *H. intricata* from eastern Texas, Louisiana, Florida and South Carolina, and discussed probable photographic records from Texas and Alabama. Specimens are now also known from Mississippi, Georgia and North Carolina, and we show a distribution map based on all these records in Fig. 1n, including some provisionally identified from photographs of live individuals (e.g., Fig. 1c). Photographs of many specimens are provided by Warren et al. (2014).

The remarkable discovery of *H. intricata*, which is now known from eight US states, is a powerful reminder of the continued need for the scientific study and collection of common, widespread butterflies. This example, together with other recent cases of “common” butterflies in the region containing undetected or undescribed cryptic species (Warren & Calhoun 2011, 2012; Pavulaan & Wright 2002, 2005), clearly demonstrates that the butterfly fauna of the eastern United States remains incompletely understood, and suggests that additional unexpected discoveries may await us.

## Acknowledgments

We thank Charles Bordelon, Richard Brown, John Calhoun, Terhune Dickel, Peter Eliazar, Thomas Emmel, Shinichi Nakahara, Harry Pavulaan and Brian Scholtens for providing data and or specimens of *Hermeuptychia* for this study. Thanks to Katrina Lane for preparing various papered *Hermeuptychia* specimens at the McGuire Center for Lepidoptera and Biodiversity, and John Calhoun for his detailed review of the manuscript. We also thank Parker Backstrom, Bill Bouton, Alana Edwards, Greg Lasley, Kathy Malone, Sean McCann, Jeff Pippen, Paul Rebman, Kim Stringer and Barbara Woodmansee for sharing their photos of *Hermeuptychia* and for discussions.

**Figure 1.** *Hermeuptychia intricata* (a, c, e, g, j, l, n) and *H. sosybius* (b, d, f, h, i, k, m) males in dorsal (a, b, e, f, i), and ventral (c, d, g, h) aspects, genitalia (males: j, k; females l, m) and distribution records (n). Live individuals are shown in c, d, and i. Some photographs were edited to remove imperfections. a. Paratype, LOUISIANA: Jackson Parish, Jonesboro, 4-VI-1920, G. W. Rawson [USNM]; b. TEXAS: Brazoria Co., Bar-X Ranch, Rd. 971N, ex ovum, eclosed 18-IV-2000, N. V. Grishin; c. TEXAS: Houston Co., Davy Crockett National Forest, Ratcliff Lake Recreation Area, 26-III-2008, © Greg Lasley (image left-right inverted); d. FLORIDA: Alachua Co., Gainesville, Kanapaha Pines III, 30-X-2011, A. D. Warren e–h. FLORIDA: Levy Co., vic. Waccasassa River, Hwy. 24, 6.8-8.8 mi SW Bronson, 6-IV-2014, A. D. Warren i. FLORIDA: Jefferson Co., SW of Lloyd, 8-IV-2007, © Paul Rebman. j–m. TEXAS: Fort Bend Co., Brazos Bend State Park, 17-VIII-2013, N. V. Grishin, dissection numbers: j. holotype, NVG130927-14; k. NVG130927-03; l. paratype, NVG130927-12; m. NVG130927-02. n. Specimen-based records with unambiguous identifications are shown as dark blue circles and photographic records are indicated as pale-blue circles.

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## From the Editor's Desk

James K. Adams

Dear members,

With this issue of the News, you are also receiving the Season Summary for 2013, as well as a copy of a new brochure for the Lepidopterists' Society. This brochure is the work of the Membership Committee and represents a nice way to advertise the society (with a picture of mine included -- shameless self promotion!).

The “Formative Experiences” column is continuing with this issue (see page 79). As indicated previously I have enough articles for the column for a few issues, so don't be upset if yours doesn't show up immediately. Also remember that there is another potential column you can contribute to (First Encounters) which will debut with the next issue. The Conservation Matters column will also make a return with the next issue in the Fall.

The voting on the three Constitutional Amendments was overwhelmingly “yes” for all three (see tally on page 62).

Enjoy this 52 page issue of the News!!