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NOTE

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BUTTERFLIES COLLECTED USING MALAISE TRAPS AS USEFUL BYCATCHES FOR ECOLOGY AND CONSERVATION

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Sampling insects using flight interception traps (e.g., malaise traps) is very effective for taxonomic, population, and community studies (Matthews & Matthews 1971; Campbell & Hanula 2007; Perillo et al. 2017). This method is generally focused on the collection of flying insect groups such as Hymenoptera, Diptera, and Coleoptera (Gressitt & Gressitt 1962; Brown 2005; Souza et al. 2015); however, other insect groups too are frequently sampled as bycatches and their information can be certainly used for several purposes. From 2013 to 2016, a study on hymenopteran communities (bees and wasps of Aculeata) was carried out throughout the Espinhaço Mountain range (12 sample locations, 700–

2,070 m) in the Brazilian states of Minas Gerais and Bahia. In total, 120 malaise traps were maintained in the field for 10 consecutive days during the rainy season from November to February. A total of 1,000 butterflies belonging to six families, namely, Pieridae (n=353), Nymphalidae (n=274), HesperIIDae (n=205), Lycaenidae (n=139), Riodinidae (n=17), and Papilionidae (n=12), were captured during the study period. As expected, because of the collecting method (many insects captured together in an ethanol-filled recipient), most butterflies became mangled and discoloured, making them hard to identify (Fig. 1; Schmidt 2016). Nevertheless, three interesting species were reported among in the collected material as they were either threatened, endemic, or undescribed (all from Minas Gerais State) (Fig. 1). These were: 1. *Strymon ohausi* (Spitz, 1933) (Lycaenidae; Image 1A (ZUEC-LEP 11044); 2. *Ypthimoides cipoensis* (Freitas, 2004) (Nymphalidae; Image 1B (ZUEC-LEP 11045) (both deposited at the Zoology Museum in Campinas University, Campinas, São Paulo, Brazil); and 3. an undescribed species of *Aricoris* (Riodinidae; Image 1C (LAK-479, LAK-481 and LAK-482; in process of description, not yet formally deposited in a collection)). The lycaenid *S. ohausi* is considered Endangered (EN) in the Brazilian Red List of threatened fauna; a single individual was collected in



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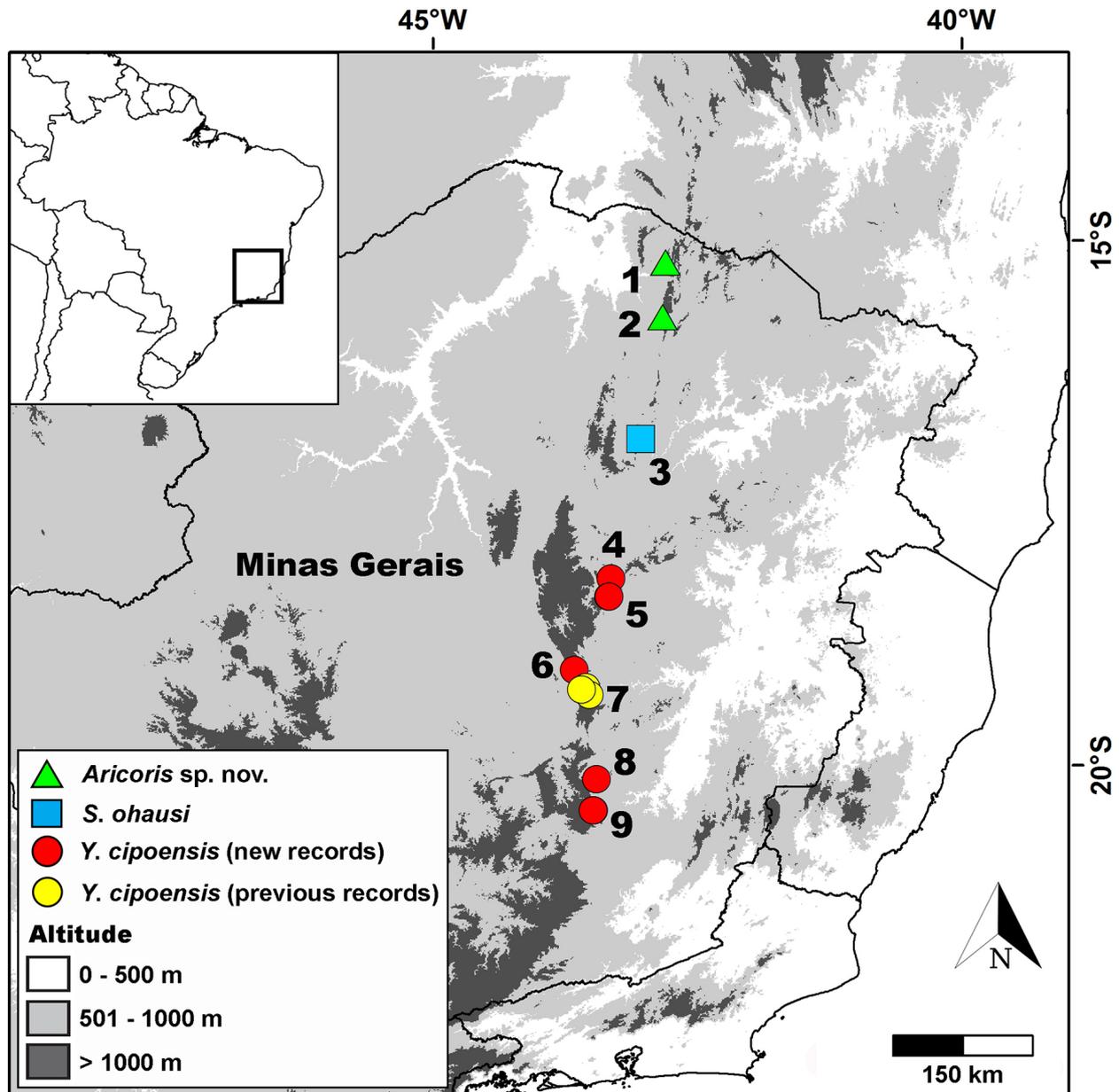


Figure 1. Collecting sites in Minas Gerais, Brazil : 1 - Serra Nova State Park, Porteirinha | 2 - Pico da Formosa, Santo Antônio do Retiro | 3 - Botumirim State Park, Botumirim | 4 - Rio Preto State Park, São Gonçalo do Rio Preto | 5 - Pico do Itambé State Park, Santo Antônio do Itambé | 6 - Pico do Breu, Santana do Riacho | 7 - Serra do Cipó (three nearby sites), Santana do Riacho | 8 - Serra do Caraça, Catas Altas | 9 - Itacolomi State Park, Mariana.

Botumirim State Park, Botumirim, representing a new occurrence record for the species. For the nymphalid *Y. cipoensis*, an endemic species previously known from three localities in the Serra do Espinhaço (Freitas 2004), seven individuals were collected in five localities, which are all new occurrence records for the species. An undescribed species of *Aricoris* (Riodinidae) (J.R. Lemes & L.A. Kaminski pers. comm. January, 2018), identified primarily by DNA sequencing, was collected in two

localities and will add important geographic information for its description. The new records were important in expanding the distribution ranges of the former two species. For *S. ohausi*, the extent of occurrence (EOO) and occupancy area (AOO) increased from 423,600km² and 48km² to 472,500km² and 52km², respectively. For *Y. cipoensis*, the increase in both EOO and AOO were much larger, from 22km² and 12km² to 6,800km² and 36km², respectively. This means that the assessment for

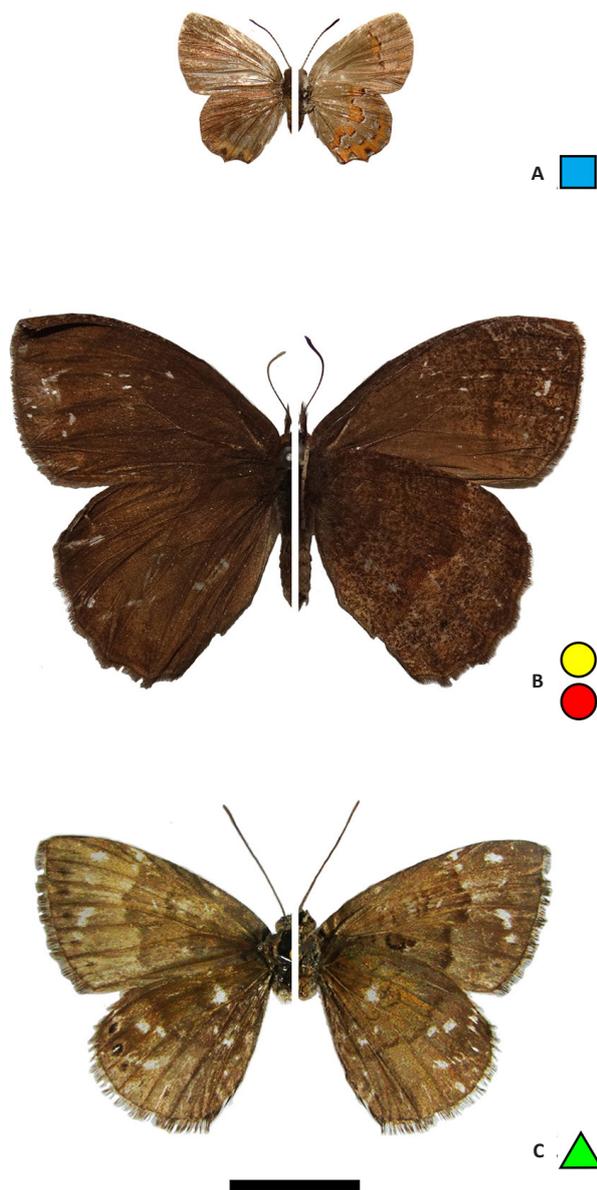


Image 1. Butterflies collected with malaise traps: A - *Strymon ohausi* | B - *Aricoris* sp. | C - *Ypthimoides cipoensis* (left - dorsal view, right - ventral view; bar = 1cm). © Augusto H.B. Rosa and André V.L. Freitas.

Y. cipoensis under criterion B (geographic distribution) (IUCN 2012) changes from Critically Endangered (CR B1) to Endangered (EN B2), a more realistic conservation status. These new records highlight the importance of storing and making available all collected material in large biological inventories, even when these are not the focal taxa of the study. In the present case, although most butterflies in malaise traps got tattered and were difficult to identify, their data was important for providing relevant information for taxonomic, genetic, and conservation studies.

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