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NEW BUTTERFLY RECORDS FROM GUANA ISLAND, BRITISH VIRGIN ISLANDS (LEPIDOPTERA: NYMPHALIDAE)

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Guana is a small island of only 297 ha (18°28'N, 64°35'W), located on the north side of Tortola in the British Virgin Islands. Becker & S. Miller (1992) published a list of butterflies known from Guana, based on collections made between 1984 to 1990. They recorded 31 species from the small island, which is quite a high count considering that nearby but much larger islands have about the same recorded number (Tortola at 5444 ha has 31 species and St. Thomas at 7660 ha has 32 species; J. Miller 1994; Davies & Smith 1998). Lazell (2005) discussed the high number of butterfly species relative to the island size, and also commented that despite many entomologists visiting Guana (including the late Robert Denno), no one had captured any new butterfly species (see also Becker & S. Miller 2002). No new species were recorded until Oct 2008 when *Anaea astina* (Fabricius) and *Anartia jatrophae* (Linnaeus) were collected by one of us (Lutman). The known food plants for both species have been found on Guana Island (Proctor in Lazell 2005), although neither species has been reared there.

To test existing taxonomic concepts (Smith et al. 1994), we obtained *cytochrome c oxidase I* ("DNA barcode") sequences from these specimens and comparative material, based on standard techniques at the University of Guelph (Craft et al. 2010; Ratnasingham & Hebert 2007). Genetic distances are expressed by Neighbor Joining with the Kimura 2 parameter as implemented in the Barcode of Life Database (Ratnasingham & Hebert 2007). Voucher specimens are deposited in the National Museum of Natural History, Smithsonian Institution.

Anartia jatrophae was predicted by Becker & Miller (1992) as a species that would eventually be found on Guana, because it occurs on the neighboring island of Tortola. In 2008, it was one of the most common species on Guana, especially on the plains around the salt pond. The DNA barcodes from Guana (Specimens USNM ENT 719001-3, Genbank HM900671-HM900673) are identical to each other, and to one of several haplotypes from Costa Rica (Genbank GU333749), consistent with the view of this as a widespread polymorphic species (Gillham 1957; Silberglied et al. 1980), rather than requiring recognition of the Puerto Rican Bank subspecies *Anartia jatrophae semifusca* Munroe (Smith et al. 1994).

One *Anaea astina* was collected and another was observed; not as common as *Anartia* in 2008.

The taxon *astina* has variously been considered a subspecies of *Anaea troglodyta* (Fabricius) or a species restricted to the Virgin Islands (Smith et al. 1994). The DNA barcode of the Guana specimen (USNM ENT 719004, Genbank HM900674) is 1.24-1.4% different from 3 specimens of *Anaea troglodyta* from the Dominican Republic (Genbank GQ256760, and new sequences from USNM ENT 719005-6, Genbank HM900593-HM900594). The Guana sequence differs by 1.61% from a specimen published as *Anaea troglodyta* from a butterfly farm with Florida origins (Genbank DQ338573, Aduse-Poku et al. 2009). These levels of genetic distance are often found within Lepidoptera species, but could also be consistent with distinct species (Craft et al. 2010). Unfortunately, no material suitable for DNA analysis is immediately available from Puerto Rico to test the status of *Anaea borquenalis* as recognized by Smith et al. (1994). Further data from more localities will be necessary to fully evaluate the status of taxa in the *Anaea troglodyta* complex, so for now we follow the classification of Smith et al. (1994).

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SUMMARY

The butterflies *Anaea astina* and *Anartia jatrophae* (Lepidoptera: Nymphalidae) are recorded for the first time from Guana Island, British Virgin Islands. This brings the total of butterfly species recorded from Guana to 33, which is very high for its small size. DNA barcode data are provided for these specimens.

REFERENCES CITED

- ADUSE-POKU, K., VINGERHOEDT, E., AND WAHLBERG, N. 2009. Out-of-Africa again: A phylogenetic hypothesis of the genus *Charaxes* (Lepidoptera: Nymphalidae) based on five gene regions. *Molecular Phylogenetics and Evolution* 53: 463-478.
- BECKER, V. O., AND MILLER, S. E. 1992. The butterflies of Guana Island, British Virgin Islands. *Bull. Allyn Museum* 136: 1-9.

- BECKER, V. O., AND MILLER, S. E. 2002. Large moths of Guana Island, British Virgin Islands: a survey of efficient colonizers (Lepidoptera: Sphingidae, Notodontidae, Noctuidae, Arctiidae, Geometridae, Hyblaeidae, Cossidae). *J. Lepidopterists' Soc.* 56: 9-44, 191-192.
- CRAFT, K. J., PAULS, S. U., DARROW, K., MILLER, S. E., HEBERT, P. D. N., HELGEN, L. E., NOVOTNY, V., AND WEIBLEN, G. D. 2010. Population genetics of ecological communities with DNA barcodes: An example from New Guinea Lepidoptera. *Proc. Natl. Acad. Sci. USA* 107: 5041-5046.
- DAVIES, N., AND SMITH, D. S. 1998. Munroe revisited: A survey of West Indian butterfly faunas and their species-area relationship. *Global Ecology and Biogeography Letters* 7: 285-294.
- GILLHAM, N. W. 1957. Subspecies versus geographic variation in Caribbean populations of *Anartia jatrophae* Johansson (Lepidoptera, Nymphalidae). *American Mus. Novitates* 1845: 1-22.
- LAZELL, J. D. 2005. *Island: Fact and Theory in Nature*. University of California Press, Berkeley. xx + 382 pp.
- MILLER, J. Y. 1994. Behavior in butterflies as a means of conservation: Comparison of insular and continental fauna. *Florida Entomol.* 77: 74-84.
- RATNASINGHAM, S., AND HEBERT, P. D. N. 2007. BOLD: The Barcode of Life Data System (<http://www.barcodinglife.org>). *Molec. Ecol. Notes* 7: 355-364.
- SILBERGLIED, R. E., AIELLO, A., AND LAMAS, G. 1980. Neotropical butterflies of the genus *Anartia*: systematics, life histories and general biology (Lepidoptera: Nymphalidae). *Psyche* 86: 219-260.
- SMITH, D. S., MILLER, L. D., AND MILLER, J. Y. 1994. *The Butterflies of the West Indies and South Florida*. Oxford University Press, Oxford. x + 264 pp., 32 pl.