



HAL
open science

DNA barcoding reveals that the reverse latitudinal gradient of Gracillariidae leaf-miners is an artifact of tropical under-sampling

Carlos Lopez-Vaamonde, David C Lees, Akito y Kawahara, Rodolphe Rougerie, Issei Ohshima, Atsushi Kawakita, Olivier Bouteleux, Jurate de Prins

► **To cite this version:**

Carlos Lopez-Vaamonde, David C Lees, Akito y Kawahara, Rodolphe Rougerie, Issei Ohshima, et al.. DNA barcoding reveals that the reverse latitudinal gradient of Gracillariidae leaf-miners is an artifact of tropical under-sampling. 5.International Barcode of. Life conference, Oct 2013, Kunming, Yunnan, China. 1 p. hal-02808562

HAL Id: hal-02808562

<https://hal.inrae.fr/hal-02808562>

Submitted on 6 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

**DNA barcoding reveals that the reverse latitudinal gradient of Gracillariidae leaf-miners
is an artifact of tropical under-sampling**

Carlos Lopez-Vaamonde, INRA-Orléans, UR633, Unité de Zoologie, Orléans, France,
Carlos.lopez-vaamonde@orleans.inra.fr

David C. Lees, Department of Zoology, Cambridge University, CB2 3EJ, UK

Akito Kawahara, Florida Museum of Natural History, University of Florida, Gainesville,
Florida 32611 USA

Rodolphe Rougerie, INRA, UR633 Zoologie Forestière, F-45075 Orléans, France

Issei Ohshima, Department of Life and Environmental Sciences, Kyoto Prefectural University,
Kyoto, Japan

Atsushi Kawakita, Center for Ecological Research, Kyoto University, Kyoto, Japan

Olivier Bouteleux, INRA, UR633 Zoologie Forestière, F-45075 Orléans, France

Jurate De Prins, Entomology Section, Royal Museum for Central Africa, Leuvensesteenweg
13, B-3080 Tervuren, Belgium

Abstract

Higher taxa often show increasing species richness towards tropical low latitudes, a pattern known as the latitudinal biodiversity gradient (LBG). A rare reverse LBG (with greater richness towards temperate high latitudes) is exhibited by Gracillariidae moths, in which most described species, occur in northern temperate areas. We carried out the first assessment of gracillariid species diversity in two Neotropical regions to test whether the relatively low tropical species diversity of this family is genuine or caused by insufficient sampling and a strong taxonomic impediment. Field surveys in six French Guianan and one Ecuadorian site produced 516 gracillariid specimens that were DNA barcoded to facilitate identification and to match larvae inside leaf-mines with adults. Species delineation from sequence data was approximated using Automatic-Barcode-Gap-Discovery and Refined-Single-Linkage-Analysis through the Barcode Index Number system, and the proportion of described/undescribed species was estimated after comparison with types. Strikingly, at least 85% of the species collected as adults were found to be undescribed. The results from both our molecular and morphological analyses indicate that the current reverse LBG seen in this group is an artifact of insufficient sampling and a strong taxonomic deficit in the Neotropics.