



HAL
open science

Arthropods of Bahía Exploradores (Chile: Aysén) as bioindicators of human activities: Identifying diversity and abundance

Paul Amouroux, Estrada Patricia, Christian Gonzalez Aravena, Patrich Cerpa, Francisco Urrea, Jorge Pérez-Schultheiss

► **To cite this version:**

Paul Amouroux, Estrada Patricia, Christian Gonzalez Aravena, Patrich Cerpa, Francisco Urrea, et al.. Arthropods of Bahía Exploradores (Chile: Aysén) as bioindicators of human activities: Identifying diversity and abundance. International Symposium of LabEx DRIIHM, Sep 2021, Toulouse, France. , 10.34972/driihm-b6decf . hal-03357090

HAL Id: hal-03357090

<https://hal.science/hal-03357090>

Submitted on 28 Sep 2021

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.

Arthropods of Bahía Exploradores (Chile: Aysén) as bioindicators of human activities: Identifying diversity and abundance

Amouroux P.^{1,2,*}, Estrada P.³, Gonzalez C.³, Cerpa P.⁴, Urra F.⁵, Pérez-Schultheiss J.⁵

¹Pontificia Universidad Católica de Chile, Facultad de Agronomía e Ingeniería Forestal, Macul, Chile.

²Observatoire Homme-Milieu International, (OHM-I) Patagonia-Bahía Exploradores, Labex DRIIHM INEE, CNRS, Paris, France.

³Universidad Metropolitana de Ciencias de la Educación, Instituto de Entomología, Ñuñoa, Chile.

⁴Sociedad Chilena de Entomología, Santiago, Chile.

⁵Museo Nacional de Historia Natural de Chile, Santiago, Chile.

* Corresponding author: pamourou@yahoo.fr



Introduction

Arthropods are commonly used as bioindicators for evaluating the quality of habitats due to their diversity and/or abundance rapidly evolve in response to environment changes. Bahía Exploradores (Aysén Region, northwest Patagonia, latitude 46 °S) is a remote and nearly pristine valley of glaciated southern Chile. The arthropods of this area can illustrate the human colonization within the valley, but they are little known. The objective of this study was to characterize the diversity and abundance of arthropods in two areas with contrasted levels of human impact in order to identify the most adequate taxon. The first site is the human-environment observatory (OHM) Patagonia where the human presence dates back to more than 50 years. The second site is the locality 'Teresa' where the human settlement is contemporary.

Materials and Methods

When One week during January 2019, 2020 and 2021

Where Two contrasted human activities sites: OHM Patagonia and Teresa (Fig. 1).

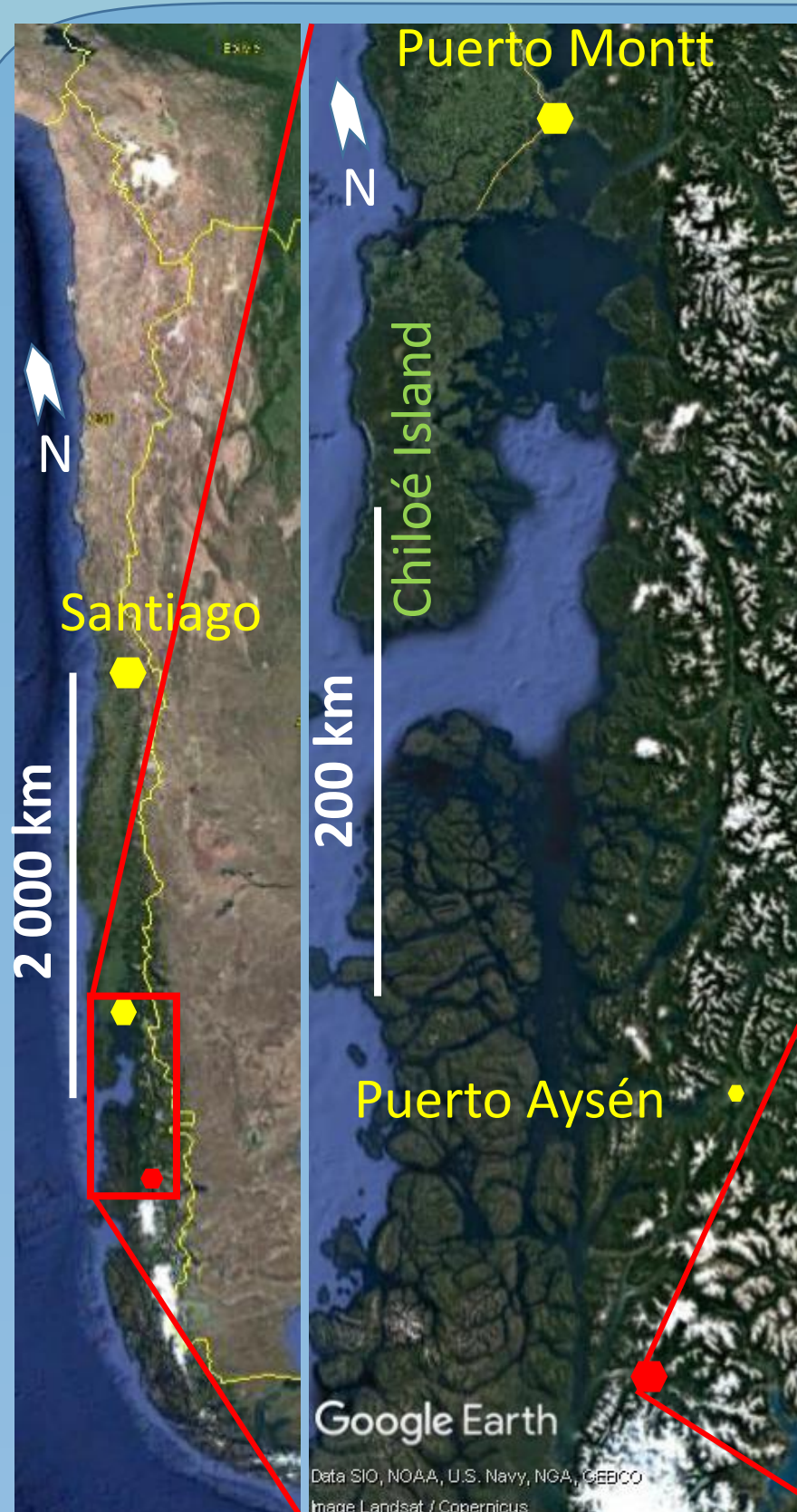


Fig. 1: Localization of the two sampled sites. Modified from Google Earth.

How Using pitfalls (Fig. 3), pan traps, night light traps, flight intercept traps, Malaise (Fig. 2), and active collecting (diurnal and nocturnal)



Fig. 4: Oniscoidea



Fig. 3: Pitfall trap



Fig. 2: Malaise trap



Fig. 5: Opiliones

Who CRUSTACEA: Isopoda (Fig. 4) and Amphipoda
ARACHNIDA: Opiliones (Fig. 5)
INSECTA: Orthoptera, Hemiptera, Coleoptera, Lepidoptera, Hymenoptera and Diptera.

Results and discussion

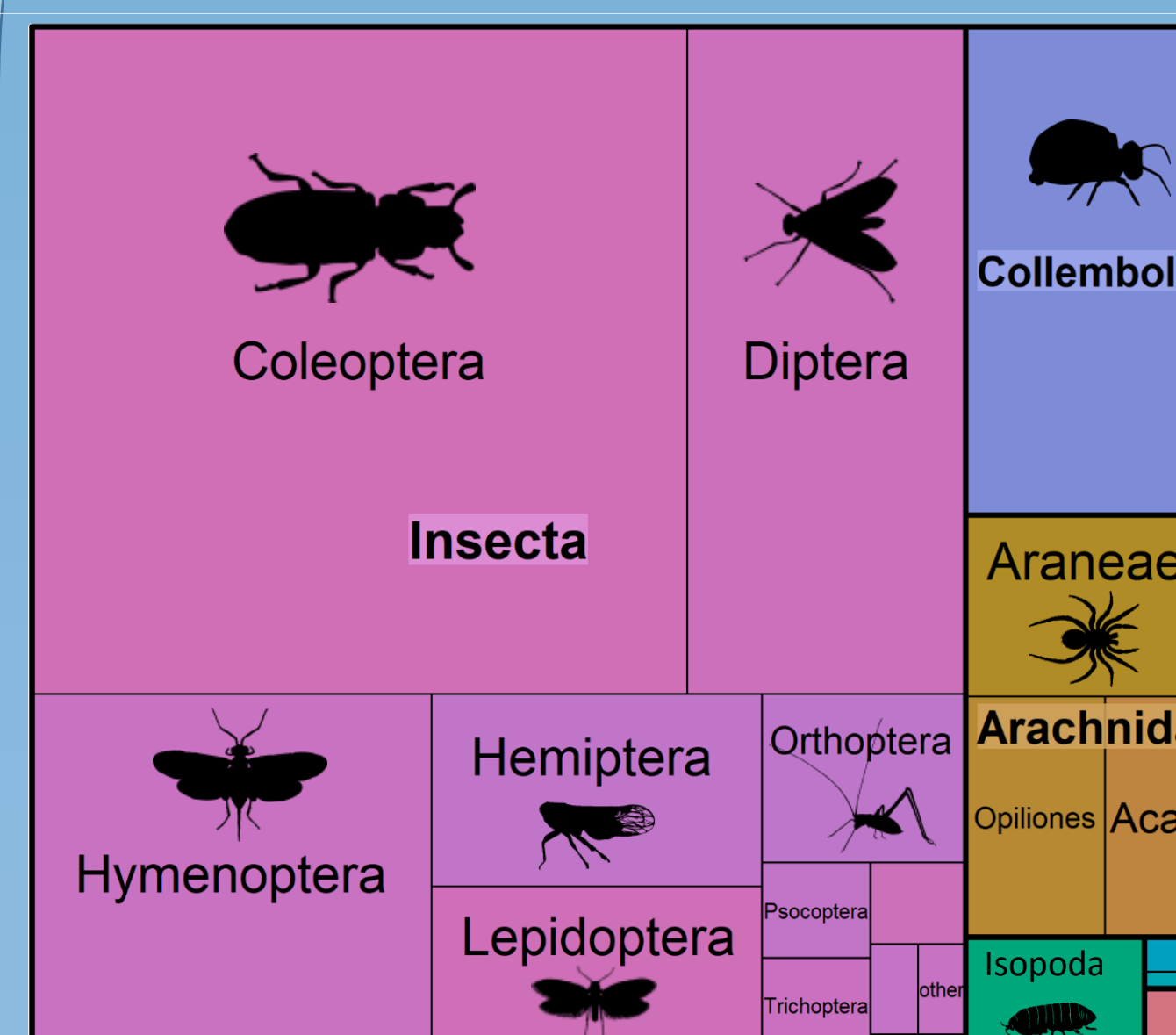


Fig. 6: Treemap of main order abundances.

A total of 981 individuals were collected in the OHM Patagonia and 429 in Teresa. The most abundant insect orders were Coleoptera (36%), Diptera (15%) and Hymenoptera (12%) (Fig. 6).

Silhouette images from Phylopic.org under Public Domain Dedication 1.0 license.

Table 1: Abundance and richness (family and species) in each site.

Taxon	OHM Patagonia			Teresa		
	Number of Individuals	Number of families	Number of species	Number of individuals	Number of families	Number of species
Coleoptera	422	56	21	130	35	18
Diptera	62	23	19	24	13	13
Lepidoptera	55	13	33	9	3	3
Opiliones	12	2	3	25	4	4

In general, Teresa appeared less abundant and diverse than OHM Patagonia (Table 1). The order **Coleoptera** was the most diverse and abundant taxon. However, the results is highly related to the sampling effort, the climatic conditions, and the techniques used.

Conclusion

This survey provided information on the diversity of this Chilean southern region and specimens were deposited in public national collections (MNHN, IEUMCE). Coleoptera could be one of the most useful terrestrial taxon for future investigation on human impacts on the environment. Nevertheless, taxa with aquatic larvae could also be useful to investigate river/water quality. However, sampling effort and methods need to be standardized to future comparison. Moreover, surveys must to be done in other seasons (months) to increase the species detection.

Acknowledgments

This work was cofunded by the Labex DRIIHM, French programme "Investissements d'Avenir" (ANR-11-LABX-0010), and by the ANID - FONDECYT postdoctorado #3180344