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

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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).

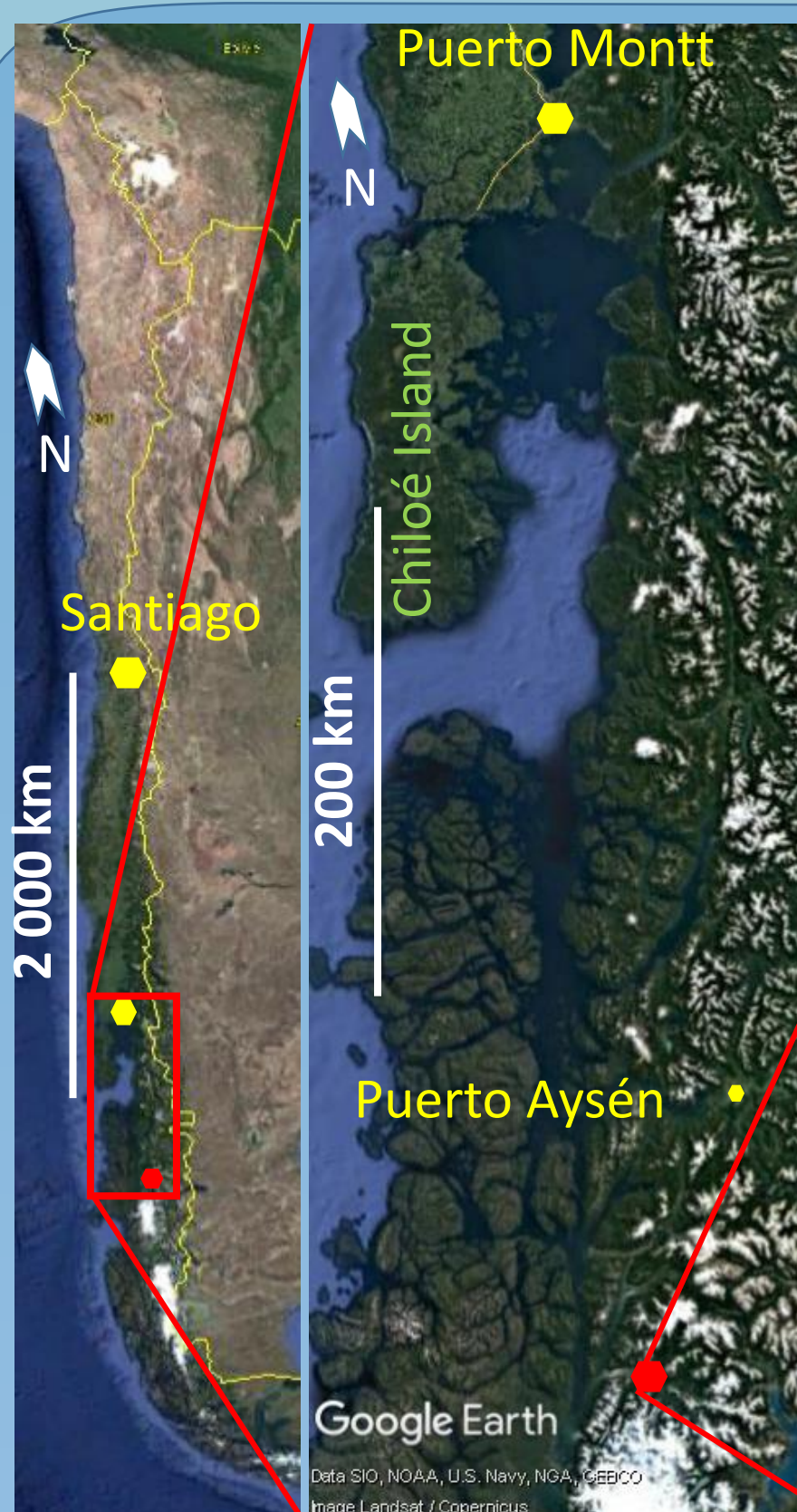


Fig. 1: Localization of the two sampled sites. Modified from Google Earth.

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

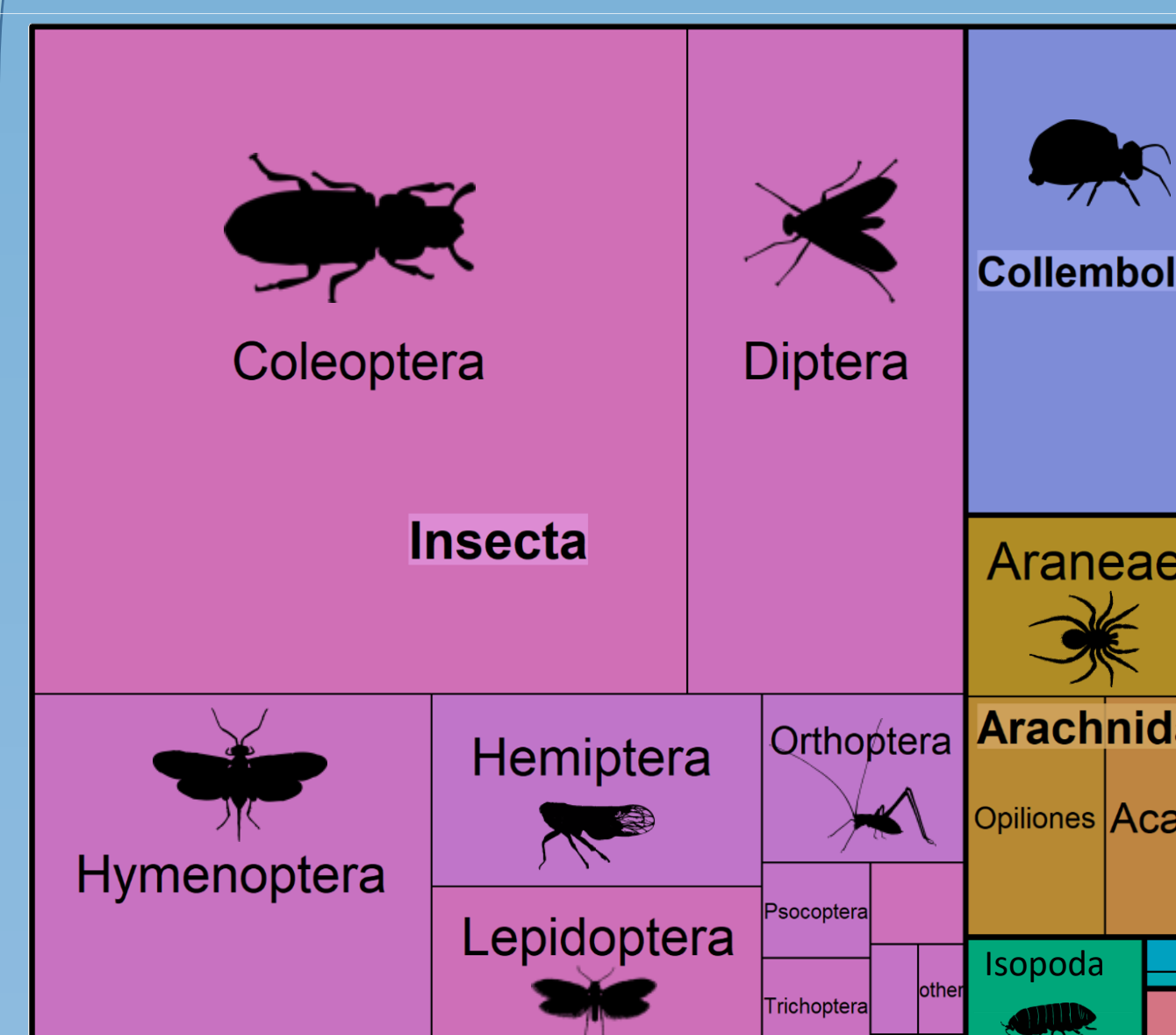


Fig. 6: Treemap of main order abundances.

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).

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

Taxon	OHM Patagonia			Teresa		
	Individuals	families	species	individuals	families	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.

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