62. *Scaptomyza graminum* Fallén, 1823

63. *Scaptomyza pallida* Zetterstedt, 1847

64. *Scaptomyza elmoi* Takada, 1970

65. *Scaptomyza himalayana* Takada, 1970

XI. Genus *Zaprionus* Coquillett

Subgenus *Zaprionus*

66. *Zaprionus indianus* Gupta, 1970

Chromosomal inversion polymorphism analysis of a population of *Drosophila polymorpha* of the Serra do Tabuleiro State Park, Brazil.

Ramírez, M.F., B. Wildemann, and D.C. de Toni. Departamento de Biologia Celular, Embriologia e Genética – Universidade Federal de Santa Catarina, Florianópolis, Brasil; E-mail: detoni@ccb.ufsc.br.

The Atlantic Rainforest comprises a vegetal formation that covers a great territory of Brazil and also parts of Paraguay and Argentina (Ishiy *et al*., 2009). Due to its coastal location, this is one of the ecosystems that presents a higher risk of extinction. However, this Biome consists on one of the most important reservoirs of biodiversity on the planet. Because of this, the genetic analysis of insect populations as bioindicators in the remaining areas of Atlantic Forest in Santa Catarina State (Brazil) is very timely and is of the utmost importance for the understanding of the Biodiversity of this ecosystem, providing critical information for establishing conservation policies.

One way for assessing genetic diversity is through the analysis and characterization of chromosomal inversion polymorphisms in natural populations. In natural populations of the genus *Drosophila*, chromosomal inversion polymorphisms are frequently observed forming inversion loops, and in high frequency. The most probable explanation of this phenomenon is that while the recombination index is reduced between the alleles contained inside an inversion, the alleles contained inside it are maintained as a block that pass through generations as a unit. This block may be under natural selection and co-adapted to a particular climatic/geographic condition and, thus, they may provide reproductive advantage to his carrier (Dobzhansky, 1970; Anderson *et al*., 2005; Kirkpatrick and Barton, 2006). In addition, in *Drosophila*, the presence of chromosomal inversions provoke no reduction of fertility (Krimbas and Powell, 1992).

Heterozygous chromosomal inversions are easily observable in polytene chromosomes, present in the salivary glands of the larvae of flies. The polytene chromosomes present a series of bands of heterochromatin and puffs that are species specific, so the characterization and localization of the inversion loops are possible. *Drosophila polymorpha*, the species studied in this work, have 18 paracentric inversions described so far (Rohde and Valente, 1996; Cordeiro *et al*., 2014).

The objective of this study was to analyze the polytene chromosome polymorphisms of a *Drosophila polymorpha* population of a primary formation of the Serra do Tabuleiro State Park (27°44'48"S; 48°48'43"W), Brazil (Figure 1). This park is the biggest conservation area of the Santa Catarina State, comprising almost 1% of his territory. The flies were captured in the field using traps designed by Roque *et al*. (2011) and cultured in the laboratory. Isolines from single females of *D. polymorpha* were founded, using the medium described by Bizzo *et al*. (2012). Species were determined and confirmed from the analysis of the F1 male genitalia.

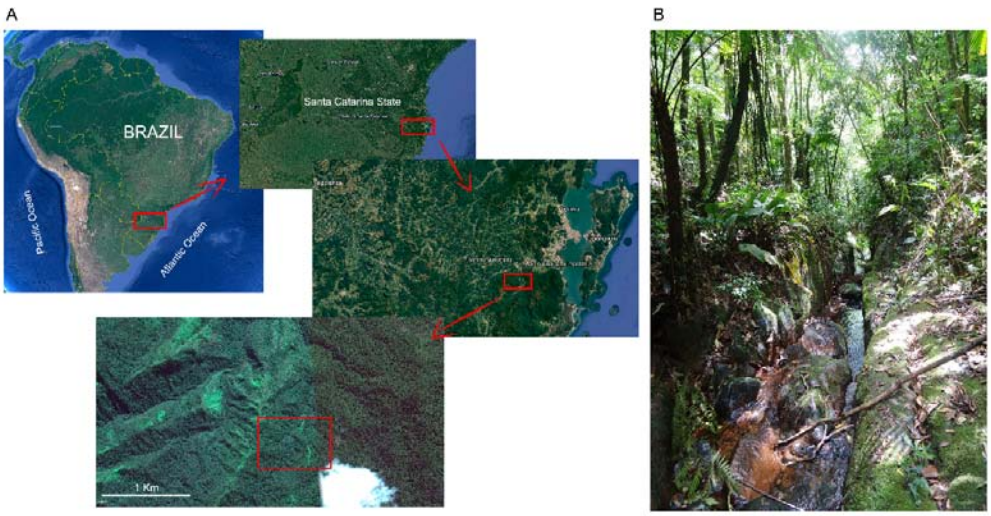

Figure 1. Characterization of the study site. A) Map of the study site in Brazil, showing Santa Catarina State. Map of Santa Catarina State, highlighting the collection area at Santo Amaro da Imperatriz, with satellite images of the region limited by the red rectangles (Reference: http://maps.google). B) Typical collecting site.

Next, polytene chromosome preparations were obtained from third instar larvae and photographed for analysis of heterozygous chromosomal inversions. Three chromosomal inversion polymorphisms were detected, all located on the right arm of chromosome 2.

These results reveal that there is a well-established inversion chromosomal polymorphism, which allows characterizing these continental populations and contrasting them with other conservation units, both continental and insular. This indicates the need for stabilizing effective conservation policies in this park.

References: Anderson, A., A. Hoffman, S. Mckechnie, P. Umina, and A. Weeks 2005, Molecular Ecology 14: 851–858; Bizzo, L., T. Vanderlinde, B. Wildemann, and D.C. De Toni 2012, Dros. Inf. Serv. 95: 121-122; Cordeiro, J., D.C. De Toni, G.S. Silva, and V.L.S. Valente 2014, Genetica 142: 461-472; Dobzhansky, Th., 1970. Columbia University Press, New York; Ishiy, S.T. *et al*., 2009. Fundação do Meio Ambiente – FATMA 80; Kirkpatrick, M., and N. Barton 2006, Genetics 173: 419–434; Krimbas, C., and J. Powell 1992, C.R.C. Press, Boca Raton, FL, 2-52; Rohde, C., and V.L.S. Valente 1996, Braz. J. Genetics 19: 27-32; Roque, F., S. Oliveira, and R. Tidon 2011, Dros. Inf. Serv. 94: 140-141.

A geometric analysis of the macronutrient needs of *Drosophila suzukii* larvae.

Fellous, Simon* and Anne Xuéreb. CBGP, INRA, CIRAD, IRD, Montpellier SupAgro, Univ. Montpellier, Montpellier, France; *author for correspondence: simon.fellous@inra.fr

Abstract

The nutritional needs of animals largely depend on their ecology and habitat. Phenotypes and general performance often depend on the synergistic influence of multiple nutrients. These effects are currently studied within the geometric framework of nutrition. Contrary to its close relative *Drosophila melanogaster*, the invasive Spotted-Wing *Drosophila*, *Drosophila suzukii*, attacks fresh, undamaged fruit devoid of microbial growth. Different oviposition habits suggest different nutritional needs by the two species. We investigated the combined influence of carbohydrate and protein concentrations on the larval performance of a *D. suzukii* population. Proportions of individuals that survived until the adult stage were maximal at intermediate protein and low sugar concentrations. Larval development was shortest under high protein diets. Observations on this population are congruent with what is known of *D. suzukii* larval ecology, as ripening, undamaged fruit is generally poor in sugars and proteins in comparison to ripe, yeast-colonized fruit. We discuss the limitations