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A N I N T E R N A T I O N A L J O U R N A L

Vegetation and Pollen Rain Relationship from the Tropical Atlantic Rain Forest in Southern Brazil

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ABSTRACT

The relationship between the southern Brazilian tropical Atlantic lowland rain forest and modern pollen rain was studied by pollen traps. The study was carried out on a one hectare plot undisturbed rain forest of the reserve Volta Velha and two secondary forests, ±50 and 7 years old. About 248 identified tree, shrub and herb species (excluding epiphytes) of 50 families were represented by 126 different pollen and spore types (including non-local taxa). The calculated average influx of pollen rain from the native Atlantic rain forest was 12465 pollen grains per cm^2 and year. The influx from the ±50 years old and from the 7 years old secondary forest was relatively low (4112 and 3667 grains per cm^2 and year, respectively) compared to the undisturbed rain forest. The occurrence of pollen grains of herbs and fern spores were significantly higher in the secondary forests than in the undisturbed rain forest.

Key words: Southern Brazil, modern pollen rain, tropical Atlantic rain forest, secondary forest

INTRODUCTION

The relationship between tropical rain forest and modern pollen rain has been poorly studied, despite the importance for the interpretation of fossil pollen records from southern Brazil including the study site. To study the relationship between modern pollen rain and vegetation from which the pollen were originated, we installed pollen traps in a one hectare plot of undisturbed native rain forest and in two different secondary forests in the Atlantic lowland. The study area was located in the biological reserve Volta Velha (26°04' S, 48°38' W, 9 m a.s.l.) which was part of the biosphere reserve Mata Atlântica and located in the Itapoá district, the northernmost area of Santa Catarina State. The site was 5 km distant from the Atlantic Ocean and 25 km distant from the Serra do Mar mountain range (Fig. 1). The study area lied in a flat or slightly undulated coastal plain, formed by Quaternary sediments of fluvial and marine origins (Martin et al., 1988). Palaeodunes, small active rivers and inactive river channels, filled with sediments, were found in the reserve.

According to Nimer (1986) and the Atlas de Santa Catarina (1986) the climate of the study region was characterized as meso-thermic with no frosts and very humid without a dry season. The nearest weather station, São Francisco do Sul, was about 15 km south of the study area. The station recorded a mean annual rainfall of 1875 mm and a mean annual temperature of 21.4 ºC. The corresponding data for Joinville (about 30 km

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southwest of the study area) were 2171 mm and 20.3 ºC, respectively.

The undisturbed 25 m tall stratified Atlantic rain forest of the one hectare plot comprises 248 identified tree, shrub and herb species (excluding epiphytes) in 50 families (Angiospermae, Gymnospermae and Pteridophyta). The most important tree families were Lauraceae, Euphorbiaceae, Anacardiaceae, Myrtaceae and Sapotaceae. Dominant tree species were *Tapirira guianensis* (Anacardiaceae), *Aparisthmium cordatum* (Euphorbiaceae) and *Ocotea acipahylla* (Lauraceae). Important understory trees and shrubs were *Geonoma* sp., Melastomataceae such as *Miconia chartaceae*, *Miconia hymenonervia*, *Ossaea sanguinea* and Rubiaceae like *Psychotria* sp.. The rain forest was also rich in lianas and epiphytes. Contrary to other tropical forests in S Brazil (Klein, 1978), there was also a dense soil covered with Bromeliaceae (mainly *Nidularium innocentii*). More detailed data on the floristic inventory is given in Negrelle (1995). The two secondary forests referred here, were situated close to the area of the undisturbed forest. The two areas of secondary forest differed in their age, one was around 50 years old and the other was 7 years old. The ± 50 years old secondary forest was dense and around 20 m tall and its floristic composition was similar to the native rain forest. The 7 years old secondary forest was less dense, around 5 m tall, had an open canopy and a different and less diverse plant composition, dominated by Myrtaceae (*Campomanesia guavirova*), Asteraceae (*Vernonia* sp.) and Pteridophyta. Huge areas of native forests in the coastal plain, next to the study area, were replaced by *Pinus* forests in the last decades (Negrelle, 1995). Furthermore, small areas of pasture occured close to the study area.

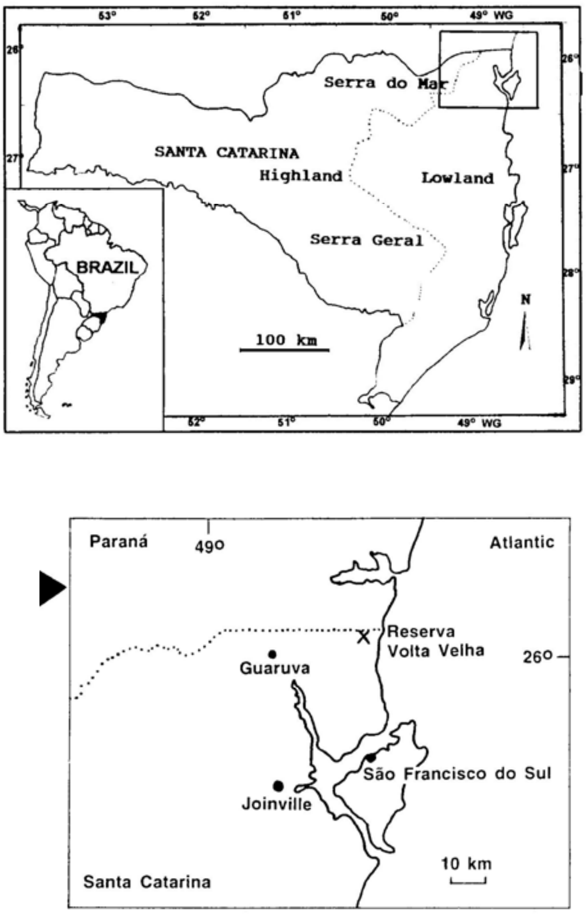

Figure 1 - Location of the study area at Santa Catarina State, Southern Brazil.

METHODS

The preparation of the plastic funnel pollen traps was performed as described by Bush (1992). In a plot area of 50 x 200 m native rain forest, divided in 10 x 20 m sections (plot area is shown in the influx 3-D representation in Fig. 3), 15 pollen traps in three parallel lines were installed. A distance of 40 m was left between each trap. The distance between line I and line II was 20 m and between line II and line III, 10 m. Further 5 pollen traps each were installed in irregular distances between 15 and 25 m, in the 7 years and ± 50 years old secondary forest. The ages of the two secondary forests were obtained from former farmers. All uncovered traps were located in the soil. Funnels were installed around 15 cm above the soil. Each pollen trap had a collecting area of 72.3 cm^2. The time period of installation for all pollen traps was from December 22nd, 1993 to December 10th, 1994. Three pollen traps (one of each different area) were not effective. The Whatman GF/D filter and the viscose rayon of all pollen traps were removed and placed in plastic packs in the field.

In total, 22 pollen trap samples, filter and rayon, were treated with 50 ml of 5% potassium hydroxide (K0H) solution for one night to free the pollen and spores. Five tablets of *Lycopodium clavatum* (one tablet containing 13900 ± 300 spores) were added to each sample for concentration calculations before treatment. To extract the pollen and spores, the samples were squashed and washed several times with distilled water. Furthermore the extract and the residue (filter and rayon) were treated with 50 ml of 47 - 52 % hydrofluoric acid (HF) for a minimum of one night to destroy minerals and the filter pieces. HF destroyed only a part of the rayon. The samples (rest of the rayon) were again squashed and washed several times. After acetolysis the samples were mounted in a glycerin medium. The pollen grains were counted in all samples to a minimum of 500. Pollen and spores were identified by reference to the author's own type collection, containing about 1400 Brazilian taxa (Behling, 1993).

The computer programs TILIA and TILIAGRAPH were used for calculations and the construction of the pollen diagram. The pollen diagram (Fig. 2) shows percentages for the most frequent taxa. The sum for percentage and concentration calculations based on the total pollen sum excluded aquatic taxa and spores. In the pollen diagram, pollen trap number 1 - 14 are from the native Atlantic rain forest, 15 - 18 are from the ± 50 years old secondary forest and 19 - 22 from the 7 years old secondary forest. Average percentages of the counted taxa of all pollen traps from each site is given in the diagram under A (native Atlantic rain forest), B (± 50 years old secondary forest) and C (7 years old secondary forest). Pollen rain data for the most frequent taxa are given in Tables 1, 2 and 3. Pollen rain compared with number of individuals of the one hectare plot is presented in Table 4. The influx (pollen grains cm^{-2} yr^{-1}) for each pollen trap in the native rain forest plot from 8 different taxa is shown in Fig. 3.

RESULTS AND DISCUSSION

Modern pollen rain

In total, 126 different pollen and spore types (15 unknown) were recorded from 22 pollen traps. Exotic pollen taxa were primarily *Pinus*, originating from surrounding plantations, and *Casuarina*, Cupressaceae and *Zea may*, probably from gardens and agriculture fields near the studied area. Aquatics, such as *Typha*, also came from outside of the study area. There were relatively high values of *Araucaria angustifolia* transported by wind from the highland (maximum was 0.6% of the total pollen sum, influx was between 0 -111 grains cm^{-2} yr^{-1}). Andean pollen taxa were also detected, transported over very long distances, including *Alnus* (0.1%, influx was 5 grains cm^{-2} yr^{-1}), *Ephedra* (1 grain) and *Nothofagus* (2 grains).

Pinus pollen grains, originated from plantations close to the study sites, was an excellent indicator of the effectiveness of the installed pollen and provided an independent tool for verifying the results. The more or less low influx variation of *Pinus* pollen (Fig. 3) between the pollen traps showed a good efficiency of the traps. The average pollen influx of *Pinus* changed very little between groups A, B and C. Influx and the frequency of the different pollen and spore taxa of the pollen assemblages of the traps were relatively variable within the same forest, and between undisturbed and secondary forests (Figs. 2 and 3).

Pollen rain from the undisturbed Atlantic rain forest

The modern pollen rain had an average influx of 12465 grains cm^{-2} yr^{-1} and was marked by the dominance of tropical trees including some shrubs (88%). Herbs (5.5%), epiphytes (1%) and ferns (7.2%) had a low representation (Table 1). The pollen diagram (Fig. 2) shows roughly three groups. The first group contained taxa which were abundant in all pollen traps, especially *Tapirira guianensis*, followed by *Alchornea/Aparisthmium*, Myrtaceae, *Myrsine*, Arecaceae and Melastomataceae. The second group comprised frequent taxa, but only in one or two pollen traps, like *Cabralea*, *Sloanea*, *Pera*, *Alseis floribunda*, *Maprounea* and *Vernonia*. The third group was formed by relatively rare taxa, but represented in most of the pollen assemblages, such as Moraceae/Urticaceae, *Didymopanax*, and *Weinmannia*. A fourth group included species which were found by single pollen grains in some traps (not presented in the diagram).

Comparisons between the pollen rain from secondary forests and the undisturbed rain forest

The average influx of 4112 grains cm^{-2} yr^{-1}in the ± 50 years old and 3667 grains cm^{-2} yr^{-1} in the 7 years old secondary forest was relatively low in comparison to the undisturbed rain forest. Taxa of trees and shrubs in the ± 50 years old and in the 7 years old forest (80% and 73.9% respectively) were well represented, but herbs were significantly higher (10.3% and 20% respectively) than in the undisturbed rain forest (Tables 1, 2 and 3). Fern spores were very abundant (38.2% and 390%, respectively). The order of abundance of pollen grains of secondary forests was also different in comparison to the native rain forest. This could be related to the different floristic composition. The pollen rain of the ± 50 years old secondary forest was more similar to the undisturbed rain forest than the 7 years old secondary forest. Percentages of Poaceae pollen grains were very high in the 7 years old secondary vegetation, and probably originated from grasses growing beneath the open canopy.

Relationship between pollen rain and native Atlantic rain forest

While comparing pollen rain with vegetation it must be considered: 1. The area of the pollen traps was small relative to the total pollen rain area of the study site. 2. Small flowers or anthers from flowering plants could drop directly into the pollen traps under the plants and might have a strong local effect. 3. The local pollen rain included also some pollen and spores, which were transported over short distance (neighbouring regions) or long distance to the study area. 4. Interspecific differences in pollen production and dispersal power occured. 5. The number of trees of each species on the one hectare plot was based on a trunk with a DBH (diameter at breast height = 130 cm) > 5 cm. Not every individual produce pollen in a juvenile stage even with a DBH > 5 cm. Comparison between collected pollen rain of each pollen trap and their surrounding vegetation (radius of 5 m) had been carried out, but because of the restrictions (especially point 5) it was too difficult and to complex too exclude juvenile and no-flowering trees.

Due to these restrictions, comparisons between pollen taxa and their number of individuals in the one hectare plot were somewhat limited. Around 248 identified tree, shrub and herb species (excluding epiphytes) in 50 families (Angiospermae, Gymnospermae and Pteridophyta) from the Atlantic rain forest were represented by 126 different pollen and spore types in the pollen traps (including taxa which were not found in the one hectare plot). Comparison between the most frequent pollen taxa and their number of individuals (Table 4) showed that several taxa were not found in the one hectare plot. Pollen taxa like *Pinus*, Moraceae/Urticaceae, *Alseis floribunda*, Cyperaceae and *Trema* come from species surrounding the study area. Pollen grains like *Araucaria angustifolia* and *Alnus* were transported by wind over long distance.

The order of frequency of pollen taxa did not correspond to the order of density of all species, but abundant pollen taxa such as *Tapirira guianensis* and *Alchornea/Aparisthmium* (group 1), were corresponded to high density species. Less frequent pollen taxa like *Clethra*, *Ilex* (group 3) were corresponded to low density species in the one hectare plot. *Cabralea*, represented only by one tree, had a very strong local effect (Fig. 3). Local effects were also found in many other taxa (group 1 and 2), as shown by the high percentage or influx values from in general only one trap sample (Figs. 2 and 3). Several families with abundant tree individuals with a DBH >5 cm (not shown in Table 4) such as Lauraceae (239 species), Monimiaceae (81), Olacaceae (61), Sapotaceae (59), Fabaceae (41), Chrysobalanaceae (39) and Annonaceae (32) were missing, or rarely represented in the pollen assemblages. Several rare species, which occured in the one hectare plot, were not found by pollen in the traps. Interspecific differences in pollen production and dispersal power could be responsible for some anomalies. For example *Ocotea* (121), a member of the Lauraceae, had very fragile pollen grains and was usually not found in the pollen traps.

Studies on pollination (Negrelle, 2002), based on flower structure and bibliographic references, showed that trees species of the study area with a DBH > 10 cm (97 different species) were 94.9 % entomophilous, 3.1 % ornitomophilous, 1% chiropteromophilous and 1 % anemophilous. This did not exclude the possibility of wind transportation of pollen grains from e. g. entomophilous tree species. From the trees of the one hectare plot only *Podocarpus* was wind pollinated. Other wind-pollinated trees were found outside the study area; *Pinus*, *Araucaria angustifolia* and *Alnus*. Interestingly one single female *Araucaria angustifolia* tree, introduced in the study area, was pollinated by wind transported pollen grains from the highland (at least 25 km away). The average *Araucaria* pollen rain was about 32 cm^{-2} yr^{-1} in this area.

Pollen transport from rain forest species could be very limited and transported only over short distances. This was very clearly shown for instance by *Cabralea* (Fig. 3), which was found by only one tree in the one hectare plot. Influx divided by individuals (Table 4) could be roughly an indicator of pollen production. High values were found for instance by *Tapirira guianensis*, *Myrsine*, *Weinmannia* and *Didymopanax* indicating relatively high pollen dispersal power, whereas for instance Myrtaceae, *Ilex* and *Matayba* had low values, thus a relatively low pollen dispersal power. These taxa were over-represented, or under-represented respectively, in the pollen assemblages.

Table 1 - Average pollen rain data in percent (based on total pollen sum) and in influx (pollen grains cm^{-2} yr^{-1}) of the native Atlantic rain forest (based on 14 pollen traps).

Taxa	%	Min-Max	Influx	Min-Max
Tapirira guianensis	24.9	2.2-70.2	3610	192-15806
Alchornea/Aparisthmium	12.0	2.6-28.5	1485	408-4524
Myrsine	6.8	1.6-11.3	752	349-1098
Myrtaceae	6.1	1.8-15.4	720	223-2416
Sloanea	5.4	0.2-39.1	736	22-6142
Cabralea	4.3	0-42.9	412	0-3825
Pera	4.1	0.2-42.4	426	22-4235
Arecaceae (Other)	3.0	0.8-6.3	340	148-659
Melastomataceae	2.7	0.4-14.3	322	35-2031
Pinus	2.1	0.7-4.21	229	98-418
Moraceae/Urticaceae (P2)	1.8	0.6-3.5	205	66-320
Weinmannia	1.6	0.4-5.4	183	44-495
Poaceae	1.5	0.4-2.7	173	35-296
Tubuliflorae (Asteraceae)	1.5	0-3.3	179	0-467
Maprounea	1.3	0-12.9	143	0-1399
Alseis floribunda	1.2	0-16.3	223	0-3104
Vernonia	1.2	0-10.8	134	0-1229
Clethra	1.2	0-6.2	153	0-668
Didymopanax	1.2	0.4-2.6	155	42-480
Ilex	0.9	0-3.5	93	0-349
Syagrus romanzoffiana	0.8	0-3.9	93	0-549
Podocarpus	0.8	0.2-2.4	102	22-333
Piper	0.8	0-2.3	91	0-329
Moraceae/Urticaceae (P3)	0.7	0-2.0	84	0-175
Cyperaceae	0.6	0.2-1.4	72	22-175
Menispermaceae	0.5	0-4.3	58	0-431
Hedyosmum brasiliense	0.4	0-1.6	52	0-296
Peperomia	0.4	0-1.4	43	0-122

Cont. ...

Table 1 - Cont. ...

Taxa	%	Min-Max	Influx	Min-Max
Matayba	0.3	0-1.4	43	0-185
Paullinia	0.3	0-1.8	23	0-108
Cecropia	0.2	0-0.8	27	0-111
Byrsonima	0.2	0-1.2	29	0-125
Ficus	0.2	0-2.0	32	0-320
Trema-type	0.2	0-0.6	29	0-87
Amaryllis	0.2	0-1.2	20	0-93
Clusia criuva	0.2	0-0.6	24	0-111
Alnus	0.1	0-0.4	5	0-31
Sum trees and shrubs	88	77.9-96.7		
Sum Asteraceae	3.0	0.6-15.2		
Sum other herbs	2.5	1-4.5		
Sum epiphytes	1.0	0-4.4		
Sum ferns	7.2	2.2-14.6		
Average influx			12465	6172-22531

Table 2 - Average pollen rain data in percent (based on total pollen sum) and in influx (pollen grains cm^{-2} yr^{-1}) of the ± 50 years old secondary forest (based on 4 pollen traps).

Taxa	%	Min-Max	Influx	Min-Max
Tapirira guianensis	14.7	5.3-22.6	592	163-987
Myrsine	13.3	10.8-15.0	570	248-1014
Melastomataceae	9.5	2.2-29.0	326	77-896
Arecaceae (Other)	8.7	7.1-10.5	358	162-574
Myrtaceae	7.6	4.7-11.5	335	168-774
Alchornea/*Aparisthmium*	6.5	4.7-8.8	248	174-320
Pinus	5.1	4.3-6.3	210	99-360
Tubuliflorae (Asteraceae)	4.1	2.6-5.1	182	59-347
Poaceae	3.3	2.0-5.1	149	45-267
Moraceae/Urticaceae P2	2.3	2.0-2.8	93	63-147
Syagrus romanzoffiana	1.7	0.2-3.0	85	5-200
Vernonia	1.4	0.4-1.8	47	27-67
Cecropia	0.7	0.2-1.4	26	5-59
Podocarpus	0.2	0.2-1.6	47	7-93
Araucaria angustifolia	0.3	0.2-0.6	12	5-17
Cyathea	25.0	8.5-74.7	142	43-425
Sum trees and shrubs	82.7	79.6-88.6		
Sum Asteraceae	6.1	4.5-7.4		
Sum other herbs	4.2	2.2-7.1		
Sum epiphytes	0.2	0.0-0.4		
Sum ferns	38.2	18.3-91.4		
Average influx			4112	2296-6764

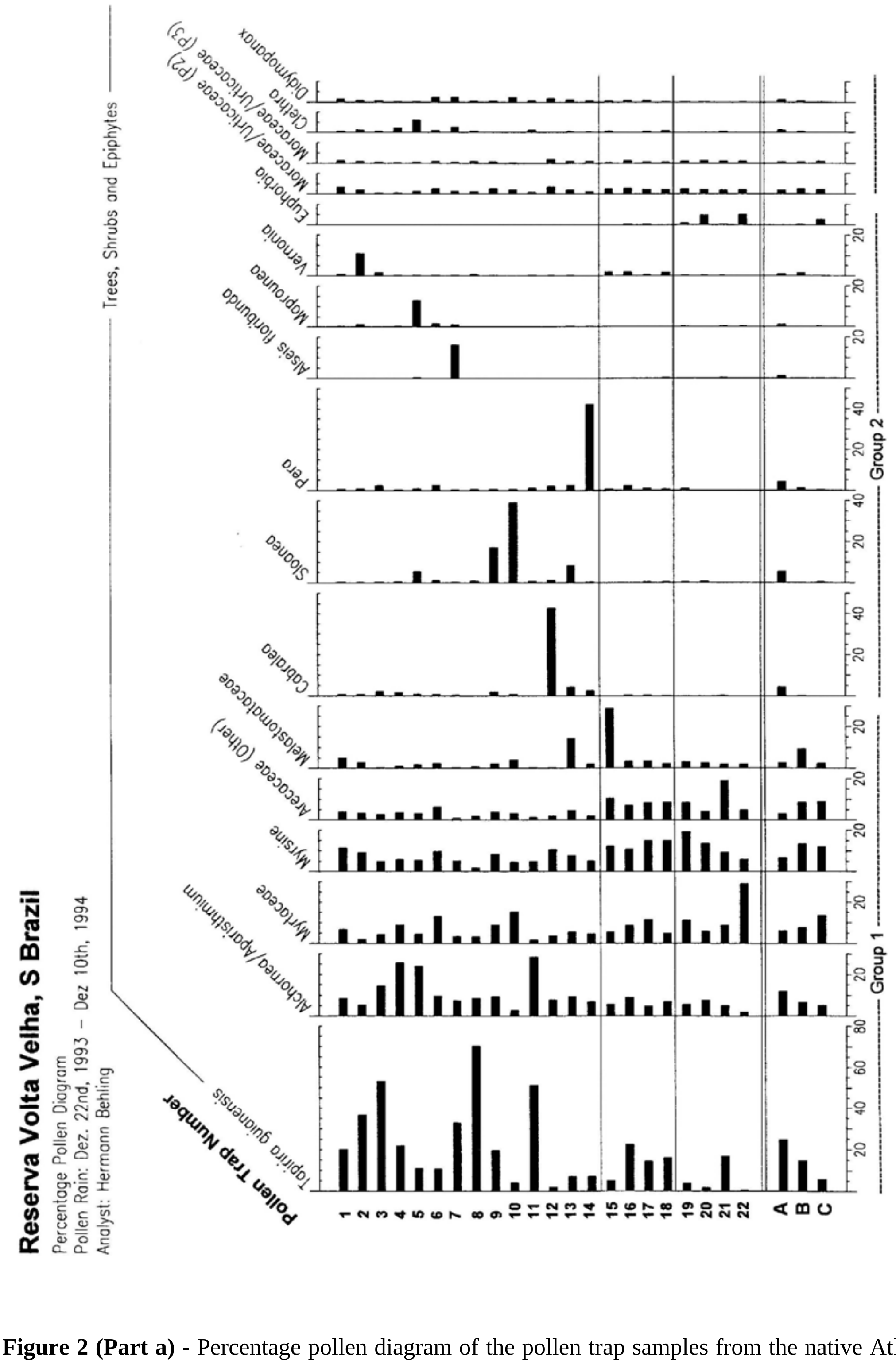

Figure 2 (Part a) - Percentage pollen diagram of the pollen trap samples from the native Atlantic rain forest (No.1 – 14, average is shown by A), the ± 50 years old secondary forest (No. 15 - 18, average by B) and the 7 years old secondary forest (No. 19 - 22, average by C) (Adapted from Behling et al., 1997).

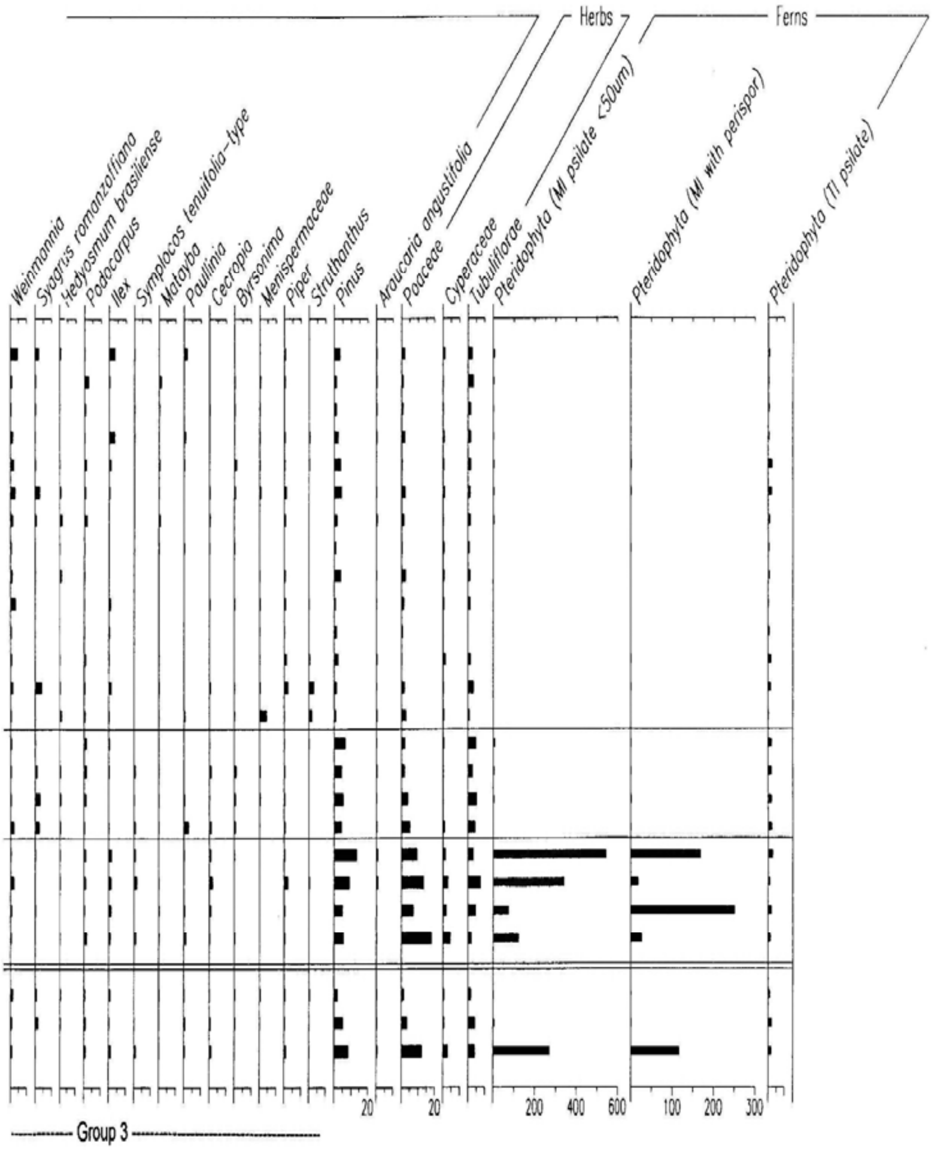

Figure 2 (Part b)- Percentage pollen diagram of the pollen trap samples from the native Atlantic rain forest (No.1 - 14, average is shown by A), the ± 50 years old secondary forest (No. 15 - 18, average by B) and the 7 years old secondary forest (No. 19 - 22, average by C) (Adapted from in Behling et al., 1997).

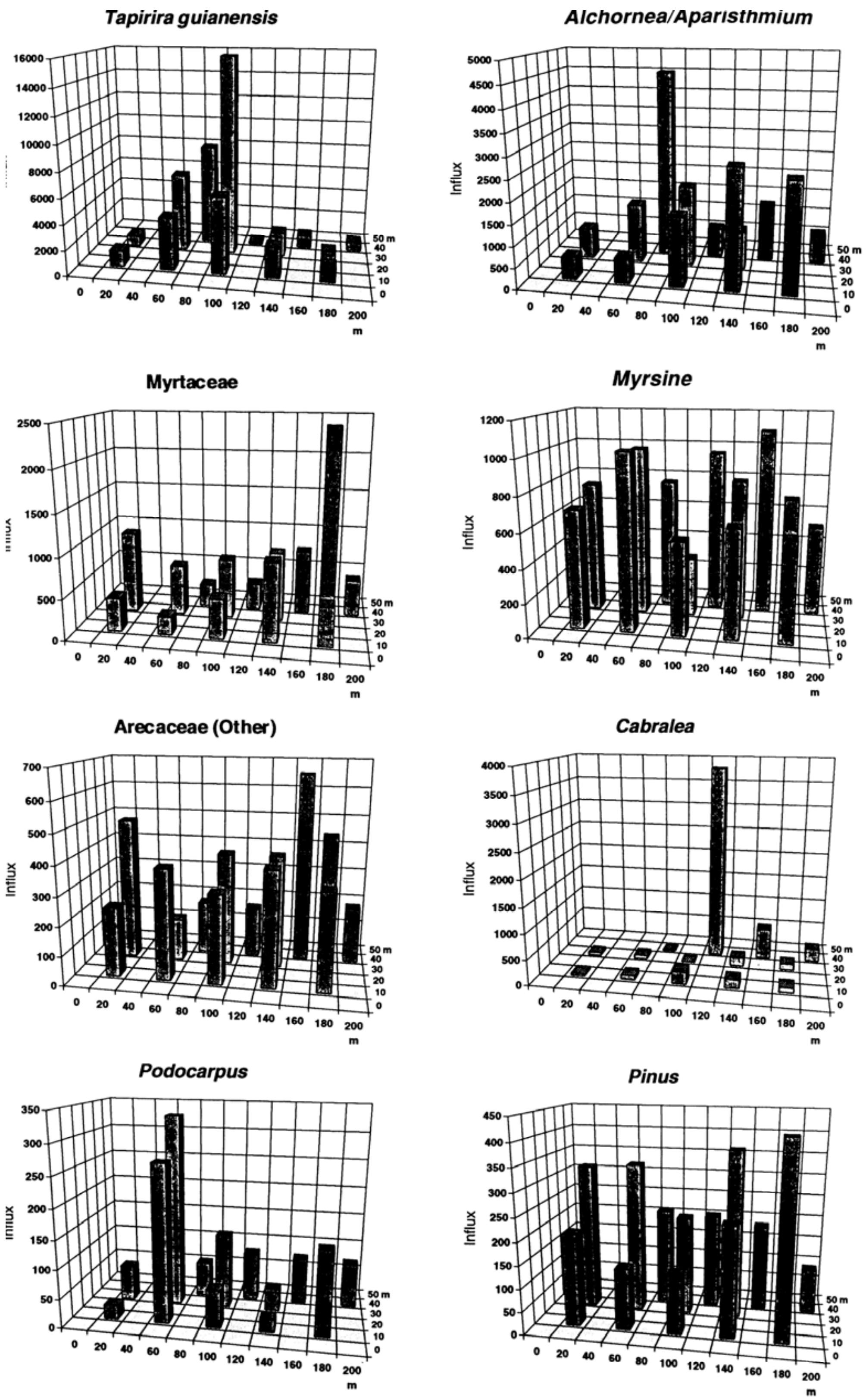

Figure 3 - 3-D representation of the influx of 8 pollen taxa in the one hectare plot area (Behling et al., 1997).

Table 3 - Average pollen rain data in percent (based on total pollen sum) and in influx (pollen grains cm^{-2} yr^{-1}) of the 7 years old secondary forest (based on 4 pollen traps).

Taxa	%	Min-Max	Influx	Min-Max
Myrtaceae	13.6	5.6-29	564	153-1476
Poaceae	12.0	7.2-18.1	454	154-921
Myrsine	12	6.0-19.4	368	307-485
Arecaceae (Other)	9.1	4.1-19	372	111-990
Pinus	8.2	4.9-13.3	249	218-277
Tapirira guianensis	5.8	0.0-17.1	257	30-891
Alchornea/*Aparisthmium*	5.0	1.9-7.6	163	90-258
Tubuliflorae (Asteraceae)	4.2	1.9-7.4	146	48-238
Cyperaceae	2.7	1.4-4.3	107	22-218
Euphorbia	2.7	0.2-5.1	102	10-258
Melastomataceae	2.3	1.9-3.1	78	51-99
Moraceae/Urticaceae (P2)	2.0	1.9-2.3	72	38-99
Cecropia	1.1	0.4-1.9	35	16-53
Podocarpus	1.2	0.4-1.9	42	19-99
Araucaria angustifolia	0.6	0.4-0.8	18	13-21
Fern (Ml psilate < 50 um)	269.3	72.5-543.6	1382	382-2778
Fern (Ml with perispor)	115.6	18.5-249.7	601	95-1316
Sum trees and shrubs	73.9	67.1-80.0		
Sum Asteraceae	4.7	2.1-8.0		
Sum other herbs	15.3	9.9-23.0		
Sum epiphytes	0.05	0.0-0.2		
Sum ferns	389.8	151.4-717.6		
Average influx			3667	1636-5211

Table 4 - Average pollen rain data in percent (based on total pollen sum) and in influx (pollen grains cm^{-2} yr^{-1}) of the native Atlantic rain forest (based on 14 pollen traps) and the number of individuals on the one hectare plot.

Taxa	%	Influx	Indiv.*	Influx/Indiv.
Tapirira guianensis	24.9	3610	121	30
Alchornea/*Aparisthmium*	12.0	1485	77/233	5
Myrsine	6.8	752	25	30
Myrtaceae	6.1	720	274	3
Sloanea	5.4	736	37	20
Cabralea	4.3	412	1	412***
Pera	4.1	426	79	5
Arecaceae (Other)	3.0	340	94	4
Melastomataceae	2.7	322	28 (65**)	12
Pinus	2.1	229	---	
Moraceae/Urticaceae (P2)	1.8	205	---/---	
Weinmannia	1.6	183	4	46
Poaceae	1.5	173	(115**)	2
Tubuliflorae (Asteraceae)	1.5	179	---	
Maprounea	1.3	143	4	36
Alseis floribunda	1.2	223	---	
Vernonia	1.2	134	---	
Clethra	1.2	153	20	8
Didymopanax	1.2	155	2	78
Ilex	0.9	93	38	3
Syagrus romanzoffiana	0.8	93	---	
Podocarpus	0.8	102	4	26

Cont. ...

Table 4 - Cont. ...

Taxa	%	Influx	Indiv.*	Influx/Indiv.
Piper	0.8	91	(5**)	18
Moraceae/Urticaceae (P3)	0.7	84	---/---	
Cyperaceae	0.6	72	---	
Menispermaceae	0.5	58	4	15
Hedyosmum brasiliense	0.4	52	---	
Peperomia	0.4	43	(7**)	6
Struthanthus	0.4	53	unknown	
Bromeliaceae	0.3	28	(very high**)	
Araucaria angustifolia	0.3	32	---	
Matayba	0.3	43	15	3
Paullinia	0.3	23	2	12
Cecropia	0.2	27	---	
Byrsonima	0.2	29	8	4
Ficus	0.2	32	3	11
Trema-type	0.2	29	---	
Amaryllis	0.2	20	---	
Clusia criuva	0.2	24	3	8
Alnus	0.1	5	---	

* Number of individuals on the hectare plot with a DBH > 5 cm, based on species, genera or family level respectively.
** Number of individuals with a DBH < 5 cm
***Strong local effect

CONCLUSION

The one year pollen trapping record from an Atlantic rain forest in South Brazil indicated that modern pollen rain was high, despite the very high rate of entomophilous pollination. Tropical taxa with abundant pollen in the assemblages were in general as frequent as the individuals in the forest and rare pollen taxa were rare as individuals. Several abundant tropical rain forest species were very rare or not represented in the pollen spectra, probably because of the very low pollen production or the poor preservation, as in the case of *Ocotea* (Lauraceae). Several rare species were not found in the pollen spectra, which, therefore, represented only a part of the vegetation. Secondary forests had a pollen rain assemblage clearly different from the undisturbed Atlantic rain forest and could be distinguished by pollen analysis. Pollen grains of herbs and fern spores were significantly higher in secondary forests than in the undisturbed rain forest and the order of abundance of pollen grains of secondary forests was also different.

These results have to be considered when interpreting fossil pollen data and modern pollen rain data from disturbed forests. Furthermore, for the interpretation of pollen records from modern pollen rain data one must consider the different environments (e.g. forest, non-forest vegetation types) from which pollen rain data were obtained and from where palaeo-pollen records were taken (e.g. lake, swamp, bog). The pollen rain data in this study were obtained from one year, whereas analyzed sediment deposits often represent many years. Data from single pollen traps under tropical forests are very variable and often show a very local assemblage (Behling, 1993). Several pollen traps or surface samples for one vegetation type are necessary to exclude local effects.

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RESUMO

Estudou-se a relação entre a Floresta Tropical Atlântica sul brasileira e a chuva polínica atual através de coletores de pólen. O estudo foi realizado em uma parcela de um hectare de floresta não perturbada localizada na Reserva Volta Velha (26^o 04' S, 48^o 38' W, 9 m s.n.m.) e duas outras

parcelas de floresta secundária (± 50 e 7 anos de idade). Cerca de 248 espécies arbóreas, arbustivas e herbáceas (excluindo epifitas), englobadas em 50 familias estavam representadas por 126 diferentes tipos de pólen e esporos (incluindo taxa não locais). Na área não perturbada, a média do fluxo de entrada da chuva polínica foi de 12465 grãos de pólen por cm^2/ano. Nas áreas de ± 50 anos e 7 anos correspondentes a estádios florestais secundários o fluxo de entrada foi relativamente baixo (4112 e 3667 grãos por cm^2/ano, respectivamente) comparativamente à área não perturbada. A ocorrência de grãos de pólen de herbáceas e esporos de pteridófitas foi significativamente maior nas áreas secundárias do que na área não perturbada.

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