# Contribution to the Taxonomy of Eremolepidaceae, Loranthaceae and Viscaceae from Rio de Janeiro State, Brazil

**by**

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**April 2007**

## INTRODUCTION

Brazil is one of the richest countries in the world in terms of biodiversity, being part of a group of 17 countries that possess more than two thirds of the biological resources of the world. It is first in the world when the diversity of phanerogamic organisms is considered, and this fact places this country among those with a greater necessity to invest in the knowledge and conservation of our vegetational resources (Mittermeier et al. 1999).

The State of Rio de Janeiro is situated in the Southeastern Region of Brazil, limited to the north by the Espirito Santo, to the west by Minas Gerais, the Southeast by São Paulo and the east and to the south by the Atlantic Ocean. It has an area of approximately 43,305 square kilometers.

The relief of Rio de Janeiro is basically composed of mountain ranges and plains. The west of the State meets the Mantiqueira mountain range, that is also extended for the States of São Paulo and Minas Gerais, covering the culminating point of Rio de Janeiro, Pico das Agulhas Negras, in Itatiaia, with an altitude of 2,787 meters. In the central region of the Serra do Mar at 2,260 meters in altitude, Pedra do Sino extends parallel to the coast culminating in Teresópolis.

Phytogeographically the State of Rio de Janeiro is included in a biome called the Atlantic Coastal forest ("Mata"), declared a vegetation Reserve of the Biosphere by UNESCO in 1991 (SEMADS 2001), which represents one of the great Brazilian forests in area and floristic diversity, the first being Amazonia.

The Atlantic Mata possesses a vegetational diversity estimated to be about 20,000 species, with more than 6,000 considered endemic (Mittermeier et al. 1999). These are well protected, as the State of Rio de Janeiro currently has about 42 areas of conservation between National, State Parks and other types of reserves. From the time of settlement to present this diversity has been modified for various reasons, amongst which one can distinguish real estate speculation and the historical illegal extration of forest products, thus threatening a patrimony of inestimable value that is constituted by both floral and faunal species (Araújo 2000). This highlights the necessity of florist studies in our State in all the ecosystems, mainly, in groups whose diversity is still little known.

The order Santalales has a great diversity of life forms, with representatives such as autotrophs as well as terrestrial plants, root parasites, and epiphytic plants parasitic on branches. Traditionally it includes the families Opiliaceae, Olacaceae, Loranthaceae (l.s.), Santalaceae (l.s.), Grubbiaceae, Dipentodontaceae, and Misodendraceae (Engler & Krause 1935). Beyond the families cited, according to Cronquist (1981), Medusandraceae, Balanophoraceae, Eremolepidaceae and Viscaceae (the two last ones split from Loranthaceae). In the classification proposed by the APG (1998, 2003) the families Olacaceae, Opiliaceae, Loranthaceae, Misodendraceae and Santalaceae (including Eremolepidaceae and Viscaceae) are considered.

Parasitism evolved in at least nine groups of angiosperms totaling 278 genera and 3,900 species (Nickrent 2002), among the gymnosperms only *Parasitaxus ustus* (Viell.) Laub. is possibly a parasite plant, occurring exclusively on the roots of *Falcatifolium taxoides* (Brong. & Gris.) Laub., both in the family Podocarpaceae. They have diverse morphological and embryological characteristic as adaptations to this way of life, as for example the modification of the root system into an haustorium and the development of the endophyte, that is part of the vegetative body of some plant parasites inside the host. Some parasites are totally endophytic (e.g. Rafflesiaceae), the aerial part being limited solely to the flowers and fruits.

In Brazil plant parasites are represented by species of Balanophoraceae, Convolvulaceae (*Cuscuta* spp.), Eremolepidaceae, Lauraceae (*Cassytha* spp.), Loranthaceae, Olacaceae, Opiliaceae, Rafflesiaceae, Santalaceae and Viscaceae. The hemiparasite species of Eremolepidaceae, Loranthaceae and Viscaceae, together with some other species of the same order, constitute the most common [expressivo] group of parasitic plants of the world-wide flora. They are known in a general way by the popular names "erva-de-passarinho" (Portuguese), "gui" (French), "mistletoe" (English) and "mistel" (German), besides diverse others. They do not possess much economic value, however, they are known for the damage that they cause forestry, mainly in North American plantations of *Pinus* spp. deforming the wood and, also, in the Brazilian citrus plantations, diminishing the production of fruits (Rizzini 1968; Kuijt 1969), besides infesting urban trees, mainly, exotic plants such as the "almond tree-of-the-beach" (*Terminalia catappa* L.) and the "cássia" (*Senna siamea* (Lam.) I. & B.). Some plants possess pharmacological potential (Corrêa 1969; Schultes & Raffauf 1999) and the popular culture mentions species of *Struthanthus* as useful in combating pneumonia having a use as a maceration of the plants that one finds on hosts without thorns.

Controversy exists as to the taxonomic relations between Loranthaceae, Viscaceae and Eremolepidaceae. Some authors consider these composed of only one family Loranthaceae with two subfamilies, Loranthoideae and Viscoideae, the latter with two tribes Phoradendreae and Eremolepideae (Eichler 1868; Engler 1889; Engler & Krause 1935; Rizzini 1982). Morphological, cytological and embryological studies (Dixit 1962; Barlow 1964; Barlow & Wiens 1971; Singh & Ratnakar 1974; Kuijt 1969, 1981, 1994) prove consistent differences exist between the three groups, and that they must be treated as independent families, thus, this was presented in the evolutionary system of Cronquist (1981).

The three cited families consist of about 84 genera and 1,270 species, mainly, in the tropics and some in the temperate zones of the world (Rizzini 1978; Heywood 1978; Cronquist 1981). In Brazil they occur in about 12 genera and 220 species (Rizzini 1956).

In the neotropics the majority of the studies mention national and regional floras from some countries of Central and South America, such as Argentina (Abiatti 1946), Colombia (Brown 1990; Dueñas-Gomez 1991; Dueñas-Gomez & Franco-Roselli 2001), Costa Rica (Kuijt 1964; Burger & Kuijt 1983), Equator (Kuijt 1986), Panama (Rizzini 1960), Peru (MacBride 1937) and Venezuela (Steyermark 1957; Rizzini 1982).

Many of the Brazilian species are seen in the most excellent taxonomic studies of Eichler (1868) and Rizzini (1950, 1952a, 1956, 1972). Specific studies, for other States are the distinguished monographs of Loranthaceae (s.l.) of Rizzini (1961, 1968) for Flora Catarinense (SC), Giulietti (1971) who worked only with the genus *Phoradendron* (PE), Sugyiama (1992) on Loranthaceae (s.s.) on the Island of Cardoso (SP), Rizzini (1995) Loranthaceae (s.l.) in the Mountain range of Cipó (MG) and recently Barbosa (2000) Loranthaceae and Viscaceae in the Biome Cerrado.

For the State of Rio de Janeiro information is still scarce, and it is worth mentioning Velloso (1831) who illustrated and described under the genus *Loranthus*, 4 species of "mistletoe", Fogaça (1996) who only presents an established list of the collections deposited in the herbaria of the Institute of Research Botanical Garden of Rio de Janeiro, where 37 species in seven genera are represented, Moreira (1997) who points out two genera and five species of Loranthaceae (s.s.) for the APA Cairuçu (Parati), and of Moreira (2001a, b) who listed six species for the Restinga de Jurubatiba.

Rizzini (1956) in his monograph of the Brazilian species of Loranthaceae (l.s.) does not supply geographic distributions, however, in the examined material of the species, references to State occurrences for 16 species of *Struthanthus* can be found, one species of *Phthirusa*, three species of *Psittacanthus*, 13 species of *Phoradendron* and one species of *Dendrophthora*, thus totalling 34 species in five genera.

The studied groups occur in diverse Brazilian ecosystems and they are always recorded in the florist inventories, yet they are frequently under-represented with visualization difficulties given as the reasons for herbarium collections and identifications being badly represented in the State of Rio de Janeiro.

For didactic reasons it was opted to follow the concept of Cronquist (1981) for the treated families, because the purpose of this work was to supply a panoramic view of the state-of-the-art of this group of plants in the State of Rio de Janeiro.

The present dissertation aims to supply up-to-date knowledge of taxa of these families for the State of Rio de Janeiro in order to support future taxonomic revisions and to contribute to the study of the flora and biota of the state.

## MATERIALS and METHODS

The survey of the occurrences of species in the State of Rio de Janeiro was based on specialized literature referring to the studied families, analysis of collections and field work.

The botanical exemplars deposited in the herbaria of the State of Rio de Janeiro had been studied in order to collect popular information on the geographic distribution, habitat, names and possible host groups, besides assisting in the identification of collected material. The acronyms of the consulted herbaria follow Holmgren et al. (1990), except for the Parque Nacional da Serra dos Órgãos herbarium, which has not been indexed, thus the acronym proposed by Rizzini (1954) was adopted.

**FCAB** Herbaria Friburguense
**GUA** Herbário, FEEMA, Centro de Botânica do Rio de Janeiro
**HB** Herbaria Bradeanum
**HPN** Herbaria do Parque Nacional da Serra dos Órgãos, Teresópolis, RJ
**R** Herbário, Departamento de Botânica, Museu Nacional, Universidade Federal do Rio de Janeiro
**RB** Herbário, Seção de Botânica Sistemática, Jardim Botânico do Rio de Janeiro
**RBR** Herbário, Departamento de Biologia Vegetal, Universidade Federal Rural do Rio de Janeiro, Itaguaí
**RFA** Herbário, Departamento de Botânica, Instituto de Biologia, C.C.S., Universidade Federal do Rio de Janeiro
**RUSU** Herbaria da Universidade Santa Úrsula

Excursions in the State to the cities of Itatiaia, Teresópolis, Petrópolis, Nova Friburgo, Rio das Ostras, Resende and Macaé were carried out for collection of material, analysis of populations and [to make] photographic records.

All the collected material was processed for the herbarium according to the usual techniques described in Mori et al. (1989) and incorporated into the collections of Universidade Santa

Úrsula (RUSU), with duplicates deposited in the herbaria of the National Museum (R).

The validity of the scientific names, with basionyms and synonyms were verified in consultation with the available digital and electronic databases, International Plant Names Index (www.ipni.org) and TROPICOS (www.mobot.org/w3t/search/vast.html).

In the taxonomic treatment, the following has been included for each taxon: the original work, the type material, that when examined received an exclamation point, basionyms and synonyms, when existing, were ordered chronologically.

The abbreviation of author names for taxa followed Brummit & Powell (1992), the citation of the periodic ones followed the Botanicum Periodicum Huntianum (Lawrence et al. 1968) and the works of Stafleu (1979). The etymology for the scientific names were derived from specific literature (Rizzini 1968; Barroso 1984) or from dictionaries (Faria 1956; Rizzini & Rizzini 1983; Merrian-Webster 1986), and is presented in footnotes.

Keys for the identification of families, genera and species from the State of Rio de Janeiro have been presented. Each one of the species is preceded by a brief diagnostic description that contains characters used in the keys, followed by data on geographic distribution, material examined and comments. Representatives of each studied genus has been illustrated, representing the general aspect, as well as photographic records for some species.

The material examined for the State of Rio de Janeiro was selected in order not to repeat records of the same locality, except when it had excellent additional information (host, altitude, etc.). They were listed in alphabetical order by city, followed by locality, plant hosts when given, date of collection, phenology, collector(s), collection number and herbarium(ia); when they did not make use of a collection number, the record number of the herbarium was placed to the side of the acronym. The additional material of other States and countries was analyzed only for the purposes of recording the geographic distribution or in the case of absence of collections in the State of Rio de Janeiro, where the presence of taxon in the State is recorded in the literature.

The word ***ibidem*** has been adopted for localities that are the same as the previous citation and ***idem*** for collector(s) the same as the one from the previous citation, moreover these abbreviations were used: **s.col**. (= without collector), **s.n**. (= without collection number), **s.d.** (= without date), **s.loc**. (= without locality), **bt**. (= buds), **fl.** (= flowers), **fr**. (= fruits) and **ms.m**. (= meters above sea level).

Data on the geographic distribution of the species were based on the specialized bibliography and examined collections. The points of the collections of the examined materials had been located on the map for the State of Rio de Janeiro, originally from the Malha Municipal Digital do Brasil - 1997 (IBGE/DGC/DECAR), available electronically through IBGE (www.ibge.gov.br), where also the map of Brazil with the divisions of the units of the Federacy was obtained. The map of South America was taken from CD-Rom Base Map of Americas, produced for the Organization for Flora Neotropica (New York Botanical Gardens). The georeferenced localities had been located according to the related co-ordinate maps listed by Araújo (199?). The computer program *TrackMaker* was used, available from www.gpstm.com.br, for manipulation of the maps and insertion of the points of occurrence of the species. Maps were constructed for all the species groups.

## RESULTS

Three families have been recognized as occurring in the State, Eremolepidaceae, Loranthaceae and Viscaceae, encompassing ten genera, 49 species and 6 varieties (Table 1).

Eremolepidaceae possess a discrete representation with only one species (*Antidaphne glaziovii*) confirmed for the State, with a restricted area, however, is abundant in the places where it occurs. More species recorded in the literature for the State are, first, *Antidaphne schotii*, which is possibly extinct and second *Eubrachion ambiguum*, which does not have collections for Rio de Janeiro, however, it is common in other States.

As already mentioned, Loranthaceae have the greatest diversity of genera and species and are found in all ecosystems of the State, also mangroves where only *Struthanthus uraguensis* var. *uraguensis* and *Psittacanthus dichrous* have been recorded. The genus with the greatest number of species is *Struthanthus* with 17 species and 6 varieties, followed by *Psittacanthus* with five species and *Phthirusa* with three species. Three genera: *Cladocolea, Ixocactus* and *Tripodanthus* are represented by only one species each.

The species designated for *Cladocolea* and *Ixocactus* had for some time been classified in the genus *Phthirusa*, with which it has many intersections and whose real representation in the State is uncertain, therefore, of the three designated species, *Phthirusa janeirensis* has no collections in the consulted herbaria, *Phthirusa pyrifolia* has no collections for the State of Rio de Janeiro, and only *Phthirusa podoptera* is widely recorded, being abundant in Restingas. *Struthanthus*, also near *Phthirusa*, is the most diverse in species numbers, as already related the only one to have infra-specific taxa and where most of them are considered entities endemic to the State.

*Psittacanthus* essentially inhabits forests, with only *P. dichrous* recorded for fens and Restingas where it is commonly found. This genus is distinguished by its much larger, conspicuous flowers, extremely unusual characters compared with the other taxa studied for the State.

*Tripodanthus*, represented by *T. acutifolius*, which is a very common species the Southern Region of Brazil and in Minas Gerais, was only found recorded for the State of Rio de Janeiro.

Viscaceae is represented by only two genera in South America and both occur in Rio de Janeiro: *Phoradendron* and *Dendrophthora*, the first one with 16 species in the State and the second one with only two.

Table 1: Genera and respective numbers of species treated for the State of Rio de Janeiro.

| **FAMILIES** | | **GENERA** | **N° SPECIES** |
|---|---|---|---|
| **EREMOLEPIDACEAE** | | *Antidaphne*<br>*Eubrachion* | 2<br>1 |
| **LORANTHACEAE** | | *Cladocolea*<br>*Ixocactus*<br>*Phthirusa*<br>*Psittacanthus*<br>*Struthanthus*<br>*Tripodanthus* | 1<br>1<br>3<br>5<br>17 (+ 6 varieties)<br>1 |
| **VISCACEAE** | | *Dendrophtora*<br>*Phoradendron* | 2<br>16 |
| **TOTALS** | **3** | 10 | 49<br>(+ 6 varieties) |

**Key to the families**

1. Flowers with calyculus .....**II. LORANTHACEAE**
1'. Flowers without calyculus .....2
2. Leaves alternate, developed or reduced to scales. ..... **I. EREMOLEPIDACEAE**
2'. Leaves opposite, developed or absent..... **III. VISCACEAE**

**I. EREMOLEPIDACEAE** Tiegh. *ex* Kuijt, Journ. Arn. Arbor. 63:401. 1982. **Type Genus:** *Eremolepis*[1] Griseb., Abh. Königl. Wiss Götteingen 6:36. 1854. (*Antidaphne* Poeppig & Endl., Nov. gen sp. Pl. 2:70, t.199. 1838)

Epiphytic SHRUBS, hemiparasitic on branches of dicotyledonous trees, glabrous, with or without epicortical roots, monoecious or dioecious. Young BRANCHES cylindrical or angular, adult cylindrical, in general erect, being able to become long when pendulous. LEAVES simple, alternate, entire, developed or reduced to scales, prominent palmate nerves. INFLORESCENCES axillary, in spikes or racemes in general with a deciduous or persistent bract under each flower. Male or female FLOWERS, without vestiges of the opposite sex; aestivation valvate. Perigone 2-4-merous (absent in the male flowers of *A. viscoidea* Poepp. & Endl.). Stamens, opposite the tepals and in equal number to these, free, anthers bithecal. Pollen echinate, tricolporate (lightly reticulate in *Eubrachion*). Ovary inferior, style short, stigma capitate. FRUITS bacoid in the majority of the genera and drupes in *Antidaphne ambiguum* (Barroso 1999), black or wine-colored, with the seed enveloped in a great amount of viscin, embryo 2-cotyledonous (to acotyledonar in *Lepidoceras peruvianum* Kuijt).

Information concerning the pollination syndromes and dispersal for this group are unknown, however, one is allowed to assume that the pollination is entomophilous given the greatly reduced flowers, and with ornithochorous dispersal, as in the majority of the other "mistletoes".

The status of Eremolepidaceae as an independent family was first considered by van Tieghem (1910) who grouped the genera *Antidaphne, Eremolepis*, *Eubrachion* and *Lepidoceras*, based on floral characters, but was not considered by the subsequent scholars of Loranthaceae (l.s.). Kuijt (1968) analyzing the phylogenetic relationships of the groups included in Santalales, revalidated Eremolepidaceae Van Tiegh. as an independent family. Recent molecular studies (Nickrent et al. 1996), however, suggest the merger of this family and Viscaceae, in Santalaceae.

Eremolepidaceae is a small family composed of the genera *Antidaphne, Eubrachion* and *Lepidoceras* that, together encompass 12 species with a South American center of distribution. It is the smaller and less known of the families of "mistletoes".

Only *Antidaphne* and *Eubrachion* have representatives in Brazil. Recorded for the State of Rio de Janeiro is the occurrence of three species within the two genera.

**Key to the genera of Eremolepidaceae in the State of Rio de Janeiro**

1. Adult plants with developed leaves; epicortical roots present ..... **1. *Antidaphne***
1'. Adult plants with leaves reduced to scales; epicortical roots absent .. **2. *Eubrachion***

**1. *Antidaphne*[2]** Poepp. *et* Endl., Nov. gen. sp. pl. 2:70, pr. 199. 1938.
**Type species:** *Antidaphne viscoidea* Poepp. *et* Endl.
*Eremolepis* Griseb., Abh. Kougl. Ges. Wiss. Gottingen 6: 124.1856.
*Ixidium* Eichl. *in* Mart., Fl. bras. 5(2):130, pr.31, figs. 5, 6. 1868.
*Basicarpus* Van Tiegh., Bull. Soc. Bot. France 42:562. 1895.
*Stachyphyllum* Van Tiegh., Bull. Soc. Bot. France 42: 565. 1895.

[1] *Eremos* = solitary, *lepis* = scale, bract.
[2] near (*anti*) *Daphne,* a genus of Thymelaeaceae.

Erect SHRUBS, with epicortical roots recorded as regularly emitting haustoria, monoecious or dioecious. STEMS lightly angular, branches cylindrical. LEAVES alternate, developed, elliptical, lanceolate or obovate, nerves palmate or pinnate. INFLORESCENCES axillary, in spikes or racemes. Male FLOWERS 3-4-merous or generally naked (*A. amazonensis* Rizz. and *A. viscoidea* Poepp. et Endl.). Female FLOWERS 2-4-merous, style short and stigma capitate. FRUITS, bacoid, seeds with endosperm white or chlorophyllous, embryo 2-cotyledonous.

Genus with about seven species, strictly South American distribution, except for *A. wrightii* (Griseb.) Kuijt, endemic to the Caribbean and *A. viscoidea* Poepp. & Endl., that extends to Bolivia and Mexico (Kuijt 1988). In Brazil four species, *A. amazonensis* Rizz occur and *A. viscoidea* Poepp. & Endl. (= *A. paraensis* Rizz.) in the hiléia [island] region of Amazonia, as well as *A. glaziovii* (V. Tiegh.) Kuijt and *A. schottii* (Eichl.) Kuijt in the State of Rio de Janeiro.

**Key to the species**

1. Plants dioecious ..... **1. *Antidaphne glaziovii***
1'. Plants monoecious ..... **2. *Antidaphne schottii***

**1.1. *Antidaphne glaziovii*[3]** (Tiegh.) Kuijt, Syst.Bot.Monogr. 18: 26. 1988.
**Type:** Brasil, Rio de Janeiro, próximo ao Rio de Janeiro, *Glaziou 7665* (lectotype P, isolectotype F, K, designated by Kuijt 1988)
*Basicarpus glaziovii* Tiegh., Bull. Soc. Bot. France 42: 562. 1895.
*Eremolepis glaziovii* (V. Tiegh.) Engl., Nat. Pflanzenfam. 1: 138. 1897.
Figures: 1, 2, 4 and 5

Dioecious SHRUBS. STEMS lightly angular, branches cylindrical. LEAVES, lanceolate ca. 4-6 x 2-3 cm, rounded at apex, base decurrent; nerves pinnate, prominent. SPIKES axillary, composed of orbiculate scales below each flower. Male and female FLOWERS with 4 tepals, the male with 4 opposite stamens, the female with a style and a central stigma. FRUITS elipsoidal.

**Geographic distribution:** Brazil: MG, RJ, SP.
Selected examined material: RIO DE JANEIRO: **Itatiaia,** Planalto, 2000-2200 m alt., sobre *Croton salutaris*, 13 abr. 1963, fl., fr., *E.Pereira 7557 e C.Pereira 25* (GUA, HB, RB, RBR); *ibidem,* estrada para o Pico Agulhas Negras, 2100-2150 ms.m, 22 nov. 1994, bt., *J.M.A.Braga et al. 1578* (RB); *ibidem*, estrada para as Prateleiras, em *Croton* sp., 29 jul. 1999, fr., *C.H.R.dePaula et al. 186* (R, RUSU).
**Comments:** A very common plant on the road that leads to the Prateleiras no Parque Nacional do Itatiaia, and as I observed, parasitizing only *Croton* spp. (Euphorbiaceae), with some individuals reaching about 2 m in height. It is easily recognized by the combination of epicortical roots carrying haustoria and alternate leaves; moreover, the bracts on each flower are similar to the small leaves that become enlarged upon fruiting. Plant restricted to the Brazilian southeastern region and is according to Kuijt (1988) endemic to the Serra da Mantiqueira; in the region it enters the States of Minas Gerais, Rio de Janeiro and São Paulo.

[3] in honor of Glaziou, the French naturalist who collected the holotype.

**1.2. *Antidaphne schottii*[4]** (Eichl.) Kuijt, Syst. Bot. Monogr. 18: 33. 1988. **Type:** Brasil, Rio de Janeiro, *Schott*. s.n. (holotype W, destruído; lectotype Eichler 1868, prancha 5, fig. 31, designated by Kuijt 1988).
*Ixidium schotii* Eichl. *in* Mart., Fl. bras. 5(2):130, pr. 31,fig. 5. 1868.
*Eremolepis schottii* (Eichl.) Engl., Nat. Pflanzenfam. 3:190. 1889.
Figure: 1

Monoecious SHRUBS. STEMS angular, branches cylindrical. LEAVES oblong, ca. 7 x 3 cm, apex obtuse or rounded, base decurrent; prominent trinerved nerves. SPIKES unisexual, axillary, the male with neutral flowers at the apex. Male and female FLOWERS with 4 tepals. FRUITS unknown.

**Geographic distribution:** Brazil: RIO DE JANEIRO.
**Comments:** The collection of Heinrich Wilhelm Schott is the only one known of this plant; the holotype, deposited in Vienna, was destroyed during the Second World War. The description presented here was transcribed and adapted from Eichler (1868), whose print was also reproduced. The plant, endemic to the State of Rio de Janeiro and not recollected in last the 136 years, is possibly extinct.

**2. *Eubrachion*[5]** Hook., Flora Antarct. 2: 291. 1846.
**Type species:** *Eubrachion arnotii* Hook. f. [*Eubrachion ambiguum* (Hook. *et* Arnott) Engl.].

Erect SHRUBS, without epicortical roots, glabrous, monoecious. STEMS and branches green-yellowish, cylindrical. LEAVES opposite, developed only in the young individuals of ca. 3 mm in diam., narrowly lanceolate; in the adult plants, reduced to peltate scales, alternate, elliptical. SPIKES male and female or only female, at times grouped in racemes at the apex of the branches. FLOWERS 3-4-merous of free tepals, the male below and the female above; isosteminous androecium. FRUITS drupoid, crowned by the persistent perigone, embryo 2-cotyledonous.

Genus with only two species of which *A. gracile* Kuijt is endemic to Venezuela. In Brazil and the State of Rio de Janeiro only *A. ambiguum* is represented.

**2.1. *Eubrachion ambiguum*[6]** (Hook. *et* Arn.) Engl., Nat. Pflanzenfam. 3: 192. 1889. **Type:** Argentina, no rio Uruguay, "Sobre Mirtáceas", *Tweedie* s.n.(holotype K)
*Viscum ambiguum* Hook. *et* Arn., Bot. Misc. 3: 356. 1833.
*Eubrachion arnotii* Hook. f., Fl. Antarct. 2: 291. 1846.
*Eubrachion brasiliense* Eichl. *in* Mart., Fl. bras. 5(2): 133, pr. 44. 1868.
*Eubrachion ambiguum* var. *jamaicense* Krug. *et* Urb., Bot. Jahrb.Syst. 24: 31. 1897.
*Eubrachion andalgalense* Abbiatti, Notas Mus. La Plata, Bot. 7: 215. 1942.
Figures: 3, 4 and 5

Erect SHRUBS ca. 30-50 cm in height. STEMS and branches cylindrical. LEAVES reduced to

[4] in honor of H.W.Schott, naturalist who collected the holotype.
[5] *Eu* = true, *brachion* = arm, for the various "arms" of the plant (leafless branches).
[6] *ambiguum* = ambiguous, for being easily confused with another species.

scales, ca. 2 mm. in diameter. SPIKES axillary ca. 4-8 mm in diam. FLOWERS 3-4-merous, the male ones in the lower part of the spike, the female in the upper part, style conical, stigma undifferentiated. FRUITS ovoid.

**Geographic distribution:** Brazil: TM, MG, SP, RJ, PR, SC, RS; The Caribbean, Venezuela, Argentina, Uruguay.
**Additional selected material:** PARANÁ: **Palmeira,** Fazenda Santa Amélia, em borda de capão, sobre *Eugenia pyriformis*, 5 nov. 1967, fr., *G.Hatschbach 17698 and J.P.Fontella 211* (F, HBR, MEX, NY, RB). SANTA CATARINA: **Caxambu,** Tupitinga, Campos Novos, 700 ms.m., sobre Myrtaceae, 13 set. 1963, fl., fr., *R.Reitz and R.Klein 16183* (HBR, RB).
**Comments:** The occurrence of this species in the State of Rio de Janeiro is limited to the reference made by Rizzini (1954) in the list of plants of the Serra dos Órgãos, however, currently no other exemplar has been located in the State.

Species of wide distribution in the central-west, southeast and southern regions of Brazil, still reaching some South-American countries and the Caribbean (Kuijt 1988). Very common in the States of the South of the country, where it is restricted to Myrtaceae, especially on the genera *Myrcia* and *Eugenia*.

**II. LORANTHACEAE** Juss., Ann. Mus. Natl. Hist. Nat. 12: 292. 1808.
**Type genus:** *Loranthus*[7] Jacq., Enum. Stirp. Vindob. 55: 230, pr.3. 1762.

EPIPHYTIC parasites of branches, or more rarely trees or lianas parasitic on roots, glabrous or pilose, monoecious or dioecious. BRANCHES: 1) erect and/or half-pendulous (when the branches are long and heavy), connected to the host only at the initial haustorium, emitting or not epicortical roots that leave at the base of stem and cover the branches and stem of the host, emitting haustorial connections regularly as well as new aerial parts; 2) erect and/or half-pendulous without epicortical roots, that is, nourishing itself only through the initial haustorium; 3) of complex habit, generally occupying wide extensions on the canopy of the hosts, composition for a confusion of branches that emit adventitious roots of fixing and/or suction function; cylindrical, angular when young, nodes articulated or continuous. LEAVES present or absent, when pedicellate or sessile, opposite, rarely alternate, simple, in general crasso-coriaceous present, to the rigid times extremely, linear, ovate, obovate, lanceolate or combinations, emarginate apex, obtuse, sharp, acuminate, at times mucronate, rounded, base acute, cuneate, decurrent or rarely cordate or auriculate; nerves prominent, conspicuous or inconspicuous, palmate or pinnate; frequently amphistomatic, the stomates at times visible with the naked eye. Stipules always absent. INFLORESCENCES axillary or terminal, in racemes, spikes, umbels, cymes or glomerules. FLOWERS sessile or pedunculate, generally grouped in triads, diads or monads, entomophilous or ornithophilous, bisexual or unisexual with vestige of the opposite sex. Calyculus always present, at times inconspicuous, entire or lobed. Perigone (4) 5-6 (-12) - merous, tepals simple free between themselves, aestivation valvate, white, white-greenish or yellow and/or red or orange. Stamens in equal number as and on the elements of the perigone, alternatingly different in size; anthers bithecal, basifixed or dorsifixed, dehiscence by a longitudinal slit; pollen generally trilobed, triangular or rarely spherical. Style simple, linear, stigma capitate or ovoid, ovary inferior, simple nectary disc, generally entire or lobed. FRUITS

[7]*Lorum* = leather, *anthus*= flower, in allusion to the habit of the plant ("leather and flowers").

of various colors yellow, red, medium brown or black, ornithochorous, baccate (drupes are found in *Atkinsonia* and *Gaiadendron* and samaras in *Nuytsia*), elliptical or globose, where the scars of the perigone and the style are perceivable and at times, crowned by a persistent calyculus. They are constituted by a leathery epicarp and a viscous mesocarp, responsible for the adherance of the seed to the substratum; the seeds with chlorophyllous endosperm (except in *Psittacanthus*). Cylindrical or linear embryos, normally with two cotyledons, at times many (*Psittacanthus pluricotyledonarius* = 14).

Loranthaceae is a family of cosmopolitan distribution, however, with its genera restricted to the Old or the New World. It includes about 74 genera and 910 species, with most being concentrated in tropical regions. Hyperparasitism is common in extra-Brazilian species of *Ixocactus*, such situation not being detected in the treated species of this family in the present work.

In Brazil about eight genera and 123 species occur. They are present in all ecosystems and on diverse hosts. In the State of Rio de Janeiro six genera have been found, 28 species and six varieties, distributed in altitude from the Restingas to the Matas on a great variety of hosts.

**Key to the genera of Loranthaceae in the State of Rio de Janeiro**

1. Flowers diminutive (ca. 3 mm) aggregated in axils of leaves
2. Leaves opposite or alternate on the stem..... **1. *Cladocolea***
2'. Leaves always opposite on the stem..... **2. *Ixocactus***
1'. Flowers small (1.5-2.0 cm) or large (majority from 5.0 cm), diminutive, not aggregated in leaf axils.
3. Flowers bisexual
4. Flowers large, vermillion or yellow..... **4. *Psittacanthus***
4'. Flowers small, white-greenish..... **6. *Tripodanthus***
3'. Flowers unisexual (in dioecious plants)
5. Filaments indented laterally, anthers apiculate..... **3. *Phthirusa***
5'. Filaments not indented laterally, anthers not apiculate..... **5. *Struthanthus***

**1. *CLADOCOLEA***[8] Van Tiegh., Bull. Soc. Bot. France 42: 166. 1895.
**Type species:** *Cladocolea andrieuxii* Van Tiegh., Bull. Soc. Bot. France 42: 166. 1895.

Erect or pendulous EPIPHYTES, glabrous or lightly pilose, epicortical roots present or absent, dioecious or monoecious. Cylindrical or angular STEMS, cylindrical branches. LEAVES developed, opposite, alternate or opposite and rarely alternate in the same plant or reduced to scales, lanceolate, ovate, elliptical or spatulate. Nervation frequently pinnate, rare palmate, prominent or inconspicuous. Axillary INFLORESCENCES in heads, dichasia, spikes or racemes, at times the terminal flower aborting or reduced to only one flower. Cylindrical floral buds. FLOWERS minute, ca. 3 mm in length, unisexual with vestiges of the opposite sex in dioecious plants, or bisexual. Calyx inconspicuous, perigone 4-6-merous, tepals white-greenish, dimorphic, straight lines at anthesis. Stamens sub-sessile, anthers bithecal, dimorphic. Triangular pollen with smooth exine. Style shorter than or of the same length as the perigone, stigma of some form. FRUITS ellipsoid or round, seed with endosperm, embryo 2-cotyledonous.

*Cladocolea* was erected by Van Tieghen (1895) from species of *Struthanthus*, that besides

[8] for the fissures (*colea*) formed on the stem (*clado*) from the endogenous origin of the lateral branches.

occurring exclusively in Mexico, they have in common determinate inflorescences (in general atypical of Loranthaceae ) tearing through the cortex of the branch from where they originate. As many of the nomenclatural creations of Van Tieghen (1895), this genus remained obscure for some time until Kuijt (1975) revalidated it, publishing a revision, in which he considers the species proposals of the first author and also includes other new occurrences in other countries, amongst which *C. clandestinus* (= *Ixocactus clandestinus*) and more recently *C. alternifolia* (Kuijt 2003a).

A genus with about 21 species, the majority occurring in Mexico, and others few recorded for Panama, Venezuela and Equator. The present species represents the only one known until now for Brazil.

**1.1. *Cladocolea alternifolia*** [9] (Eichl.)Kuijt, Novon 13: 72. 2003a.
*Phthirusa alternifolia* Eichl. *in* Mart., Fl bras. 5(2): 54. 1868.
**Type:** Brasil, na cidade do Rio de Janeiro, Copacabana, 29 out. 1867, *Glaziou 2142* (lectotype BR, isolectotypes B, P; designated by Kuijt 1994).
*Passowia alternifolia* (Eichl.)Tiegh., Bull. Soc. Bot. France 42: 172.1895.
Figures: 6, 7, 9 and 11

PLANTS pendulous, without epicortical roots, dioecious. STEMS angular, branches cylindrical. LEAVES alternate, rarely opposite, ovate or oblong, surface lustrous, nerves pinnate, conspicuous. GLOMERULES axillary. FLOWERS in triads, 6-merous, unisexual with rudiment of the opposite sex, tepals and stamens dimorphic, larger alternating with smaller. FRUITS unknown.

**Geographic distribution:** Brazil: RJ, SP.
Selected examined material. RIO DE JANEIRO: **Rio de Janeiro,** Urca, trilha para o morro da Urca, sobre *Calycorectes australis*, 2 dez. 2001, fl., *C.H.R.dePaula 364* (R, RUSU); *ibidem*, sobre *Angostura* sp., 1 dez. 2003, fl., *C.H.R.dePaula 515* (RUSU). **Santa Maria Madalena,** na rifa, na descida da trilha para o descampado, 20 out. 1994, fl., *R.Marquete et al. 2061* (RB).
**Additional Selected Material:** SÃO PAULO: **Bananal,** Serra da Bocaina, sertão do rio velho, sobre Monimiaceae, 6 out. 1949, fl., *A.C.Brade and A.P.Duarte 20113* (RB).
**Comments:** This extremely rare species is known only from a few herbarium collections. Kuijt (2003a) thought that this species was probably extinct, therefore, the only collection known for it, beyond the type collection of 1870, would be that of A.C. Brade and A.P. Duarte 20113 cited by Rizzini (1956). With the present work two new localities are added where the species is known: the city of Rio de Janeiro, collected by the author, and in the city of Saint Maria Madalena (R.Marquete et al. 2061), whose collection was eroneously identified as *Struthanthus maricensis* Rizz. and was stored together with the type collection by the herbaria depositor (RB). According to Kuijt (2003a), *C. alternifolia* occupies a position of prominence in the genus, therefore it is the only one to reach the eastern portion of the continent, the geographically closest species being *C. roraimae* (Steyermark)Kuijt, found on the Roraima Mount (Amazônia).

*Cladocolea alternifolia* is extremely distinct from the other Loranthaceae occurring in the State, by having the majority of the leaves alternate, this being not a very common character in the family, and sometimes opposite (as for example in the material R. Marquete et al. 2061). The

[9] for alternate (*alterna*), leaves (*folia*), characteristic of the species.

individuals collected by the author (C.H.R. dePaula 364 and 515) have dispersed translucent dots on the leaf blade, similar to the glands of Rutaceae and Myrtaceae. The anatomical structure of this plant is unknown and, the occurrence of glands in "mistletoe" has still not been detected (J. Kuijt, pers. com.), thus, is was not possible to affirm that these are homologous to the above-mentioned glands.

**2. *IXOCACTUS*[10]** Rizz., Arq. Jard. Bot. Rio de Janeiro 12: 118. 1952. **Type species:** *Ixocactus hutchisonii* Kuijt, Brittonia 19: 62. 1967.

EPIPHYTES, glabrous, parasites on branches of dicotyledons, epicortical roots present only in *I. rhynchophyllus* Kuijt, monoecious. STEMS and branches flattened, angular or cylindrical. LEAVES developed, simple, opposite or sub-opposite, spatulate, lanceolate, elliptical, ovate or absent leaves; nerves pinnate or trinerved, prominent, conspicuous or inconspicuous. INFLORESCENCES axillary, in glomerules or as isolated flowers. Buds cylindrical. FLOWERS minimally, ca. 3 mm in length, bisexual (unisexual in dioecious plants only in *I. rhynchophyllus* Kuijt and *I. macrophyllus* Kuijt). Calyx inconspicuous, perigone 4 (-5) - merous, tepals white-greenish, straight lines at anthesis, isomorphic. Stamens sub-sessile, dimorphic, spinose pollen, 4 - 5 - copate in *I. hutchisonii* Kuijt, and not spinose, 3 - colpate in the other species (Kuijt 1991). Style short or of the same size of tepals, straight or twisted, stigma capitate. FRUITS ellipsoid or ovoid, embryo to 2 - cotyledonous.

The generic name *Ixocactus* appears for the first time in the literature when Rizzini (1952b), treating the generalities of Brazilian Loranthaceae, such as ecology, ethology and evolution, presents a key in Latin for the Brazilian genera where this name is included, however, without citing a specific epithet or a studied specimen. In the second part of exactly this work (1956), the same author when dealing with the taxonomy of the Brazilian species, omits the generic key, moreover does not make reference to an exact reference. Fifteen years after the first and only appearance of the name *Ixocactus*, Kuijt (1967), studying material collected in Colombia, recognized the plant characterized by Rizzini (1952b) and then published *I. hutchisonii* Kuijt, the first species of the genus.

The genus remained monotypic, characterized mainly by the cactiform aspect and the pollen morphology, the only one amongst the Loranthaceae and among Santalales according to Feuer & Kuijt (1985), when then 24 years later new collections, proceeding from Colombia, had been added to this genus by Kuijt (1991). These being foliose, the delimitation of the genus was extended and some species previously designated as perhaps similar to the genus *Cladocolea* Van Tieghen were transferred to *Ixocactus* Rizz. Hyperparasitism is common in the group and according to Kuijt (1991) at least *I. hutchisonii*, *I. gracilis* and *I. rhynchophyllus* are predominantly hyperparasites. One is a small genus with only about seven species that occurs from Bolivia to the Guianas and until now, only two had been recorded for Brazil, as well as for the east coast of South America, *I. clandestinus* treated here and *I. macrophyllus* recorded for the Bahia.

**2.1. *Ixocactus clandestinus*[11]** (Mart.) Kuijt, Syst. Bot. 16(2). 1991
*Loranthus clandestinus* Mart. *in* Schultes & Schultes, Syst. Veg. 7:96. 1829.

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[10] for the similar aspect (*ixo*) as a cactus (*e.g.:Schlumbergera*) the type species.
[11] *clandestinus* = secret, private, imperceptible, for the inconspicuous flowers.

**Type:** Brasil, na cidade do Rio de Janeiro, *Martius* s.n. (holotype M).
*Phthirusa clandestina* (Mart.) Mart., Flora 13:110.1830.
*Cladocolea clandestina* (Mart.) Kuijt, J. Arnold Arbor. 56: 281. 1975
Figures: 8, 9 and 11

PLANTS semi-pendulous, monoecious. STEMS strongly quadrangular, branches cylindrical. LEAVES opposite decussate, obovate, 3-nerved, prominent nerves. GLOMERULES axillary. FLOWERS 4-5-merous, bisexual. Anthers shortly apiculate. style short, angular, stigma papilose. FRUITS black ellipsoidal.

**Geographic distribution:** Brazil: AL, BA, RJ.
Selected examined material: RIO DE JANEIRO: **São João da Barra,** à margem do rio São João, 14 set. 1978, fr., *D.S.D.Araújo et al. 2172* (GUA). **Rio de Janeiro,** Jacarepaguá, Represa dos Ciganos, sobre *Miconia*, 24 jun. 1958, fr., *E.Pereira 3893* (RB, RFA); *ibidem*, morro do Archer, 15 jul. 1958, fl., *E.Pereira et al.* 3893 (RB); *ibidem*, Horto, estrada Dona Castorina, após o IMPA, sobre *Psidium guayava*, 12 abr. 1999, fl., fr., *C.H.R.dePaula and S.J.S.Neto 131* (R, RUSU); *ibidem*, Corcovado, 10 maio 1938, fl., *J.G.Kuhlmann* s.n. (RB 37258).
**Comments:** This species is little represented in herbaria. The five listed collections above represent the totality of the records found in the consulted collections.

**3. *PHTHIRUSA*[12]** Eichl. *in* Mart., Fl. bras. 5(2): 52. 1868. *nom conserv.* (Kuijt 1993). **Type species:** *Phthirusa pyrifolia* (H.B.K.) Eichl. *in* Mart., Fl. bras. 5(2): 63-64. 1868.
*Passowia* Karsten, Bot. Zeitung (Berlim) 4:107. 1846.

EPIPHYTES glabrous, parasites on branches of dicotyledons, at times with diminutive feruginous scales, dioecious. STEMS angular or cylindrical, branches erect, half-pendulous or pendulous, with or without epicortical roots, or plants of complex habit, at times with adventitious roots. LEAVES opposite, rarely alternate, broadly-lanceolate, base obtuse, apex generally attenuated, acute, emarginate, mucro at times present. INFLORESCENCES axillary or terminal, in racemes, spikes, corymbs or glomerules. Floral buds ellipsoid. FLOWERS small, ca. 1.0-1.5 cm in diam., aggregated in triads, at times adnate to the cupule formed by the three bracts, 4-6-merous, perigone white-greenish or wine-colored, tepals straight at anthesis. The males flowers with stamens epitepalous, alternatingly with the larger and smaller, filaments of anthers largest indented laterally due to pressure of adjacent smaller anthers, anthers basifixed, not-versatile, connective apiculate, pollen triangular, exine granular, tricolpate or triporate; filiform pistillode with undifferentiated stigma. The female flowers with a colunar to angular style, stigma capitate, papilose. FRUITS ovoid or oblong yellow, orange, or colored black, seed chlorophyllous with endosperm, embryo 2-cotyledonous.

The genus *Phthirusa* was described by Martius (1830) under the type species *P. clandestina* Mart. [ = *Ixocactus clandestinus* (Mart.) Kuijt ]. Eichler (1868), in the monograph of the Brazilian Loranthaceae (l.s.), extended the concept of the genus keeping the typification and the authorship of Martius (loc. cit.). Kuijt (1993), based on these data and the fact that the majority of the known plants designated as this genus agree with the concept of Eichler (1868) and not of Martius (1830), proposed *Phthirusa* Eichler nomina conservanda and *P. pyrifolia* (H.B.K.) Eichl.

[12] *Phtherein* = to ruin, an allusion to its parasitism.

as the type species.

A genus with about 60 species distributed from Central and South America, and in Brazil is estimated to contain about 29 species. Three species had been recognized to occur in the State of Rio de Janeiro. The southern limit of distribution of the species of *Phthirusa* is the State of Rio de Janeiro represented by the three species treated here, the majority of the species being in the Center-West, North and Northeast of Regions Brazil.

**Key to the species**

1. Branches angular, covered with rufo-furfuraceous scales; rachis of the inflorescences not expanded laterally, triads not immersed in the rachis.
2. Leaves emarginate at the apex, short mucronate; flowers 4-merous, white-greenish ..... **1. *P. janeirensis***

2'. Leaves acute at the apex, without a mucro; flowers 6-merous, wine-colored **3. *P. pyrifolia***

1'. Branches cylindrical, without rufo-furfuraceous scales; rachis of the inflorescence expanded laterally, triads semi-immersed in the rachis. .....**2. *P. podoptera***

**3.1. *Phthirusa janeirensis*[13]** Eichl. *in* Mart., Fl. bras. 5(2): 54. 1868. **Type:** Brasil, no Rio de Janeiro. *Martius* s.n. (holotype M, foto Field Mus. 11791, designated by Kuijt 1994).
*Passowia janeirensis* Tiegh., Bull. Soc. Bot. France 42: 172. 1895

PLANTS half-pendulous. STEMS angular and covered by rufo-furfuraceous scales, branches cylindrical. LEAVES oblong, apex emarginate or mucronate, base cuneate, 3-nerved, nerves prominent. SPIKES axillary, with rachis not laterally expanded and the triads not immersed in the rachis. FLOWERS 4-merous, tepals white-greenish.

**Geographic distribution:** Brazil: RJ.
**Comments:** *Phthirusa janeirensis* is part of a group of three species (*P. phaeocladus* Eichl. and *P. guianensis* (Kl.) Eichl.) similar in practically all the diagnostic characters, differing only in aspects of the leaves and nerves and currently, in their geographic distribution, *P. janeirensis* being endemic to the State of Rio de Janeiro and possibly extinct and the other two, known well from the region of Hiléia Amazonian. Because of the fact that exemplars of this species had not been located in the consulted herbaria, the description presented here was adapted from Eichler (1868).

**3.2. *Phthirusa podoptera*[14]** (Cham. *et* Schlecht.) Kuijt, Taxon 43(2):198. 1994.
*Loranthus podopterus* Cham. & Schlecht., Linnaea 3: 128. 1828. **Type**: Brasil, s.loc., *Gardner 1330* (neotype P, isoneotype NY, designated by Kuijt 1994).
*Struthanthus pterygopus* Mart., Flora 13: 105. 1830.
Figures: 10, 11 and 13

PLANTS semi-pendulous. STEMS and branches cylindrical, without rufo-furfuraceous scales. LEAVES ovate to at times elliptical, apex acuminate, nerves palmate, prominent. SPIKES axillary, with expanded rachis and the triads half-immersed laterally. FLOWERS minute, 6-

[13] of Rio de Janeiro, type locality of the species.
[14] *podos*= foot, *pterus* = wing, section, an allusion to the inflated inflorescences.

merous, tepals white-greenish.

**Geographic distribution:** Brazil: IF, BA, MG, ES, RJ.
Selected examined material : RIO DE JANEIRO: **Armação de Búzios,** mata do Banen Clube, sobre *Croton sp*., 11 jul. 1996, fl., fr., *D.S.D.Araújo 10444* (GUA); *ibidem*, restinga arbustiva entre as praia do Forno and Brava, 2 nov. 1983, bt., *G.Martinelli and T.Sonderstrom 9784* (RB). **Maricá,** restinga de Maricá, 22°57'069''S_42°53'247''W, sobre *Myrsine* sp., 22 jun. 2003, fr., *C.H.R.dePaula 488* (RUSU). **Petrópolis,** fazenda da Rocinha, sobre goiabeiras and jaboticabeiras, 2 nov. 1934, fl., *C.V.Freire* s.n. (R 57322). **São Pedro D'Aldeia,** fazenda a beira da RJ 106, 6 mar. 1983, fr., *H.Q.B.Fernandes 745* (GUA). **Saquarema,** R.E.E.Jacarepiá, 12 dez. 1990, bt., *D.S.D.Araújo 9213* (GUA).
**Additional selected material:** SERGIPE**: Campo Grande**, s.loc., em Myrtaceae, 19 set. 1974, bt., *M.Fonseca* s.n. (RB 17306). BAHIA: **São Gonçalo dos Campos,** s.loc., em Euphorbiaceae, 10 nov. 1983, fl., *H.P.Bautista et al. 1200* (RB). MINAS GERAIS: **Dionísio,** Parque Estadual Rio Doce, 23 nov. 1976, fl., *E.P.Heringer 16018* (RB). ESPÍRITO SANTO: **Itarana,** Jatiboca, 19°51'S_40°52'W, 630 ms.m., 14 fev. 1999, fl., *B.L.Stannard et al. 1031* (K, RB, SP).
**Comments:** This species is easily recognized by the structure of the inflorescences, singular among the Loranthaceae occurrences in the State of Rio de Janeiro. The majority of the studied collections are of individuals whose leaves typically have pinnate nerves, however, a certain trend towards palmate nerves was observed, therefore, some specimens studied have up to five nerves leaving from near the base, and the central one is always thicker than the others. A common component of the littoral flora (Restingas) where it is frequently observed on *Myrsine* spp. (Myrsinaceae). An exemplar collected in Espirito Santo by *B. Stannard 1031* has inflorescences, and from the first to produce flowers, emerge two other spikes, [a feature] not common in this species. This is about the only species designated for *Phthirusa* that is widely recorded for the State.

**3.3. *Phthirusa pyrifolia*[15]** (H.B.K.) Eichl. *in* Mart., Fl. bras. 5(2): 63-64. 1868.
*Loranthus pyrifolius* H.B.K., Nov. Gen. Pl., 3: 441. 1820. **Type:** Colombia, Provinciae Popayanensis, prope Carthago, out., *Humboldt and Bonpland 1872* (holotype P).
*Loranthus hoffmannsegianus* Schult. f., Syst. 7: 113. 1829.
*Loranthus affinis* Mart. *in* Schult. f., Syst. 7: 151. 1829.
*Loranthus subcampestris* Mart. *in* Schult. f., Syst. 7: 151. 1829.
*Phthirusa heterophylla* Rusby, Bull. N. Y. Bot. Gard. 6: 500 (1910).
Figures: 12 and 13

PLANTS pendulous. STEMS angular and covered by rufo-furfuraceous scales, adult branches cylindrical. LEAVES oblong or oblong-lanceolate, apex acute, base obtuse, nerves palmate, conspicuous. SPIKES axillary rachis not-winged. FLOWERS, diminutive, 6-merous tepals wine-colored.

**Geographic distribution:** Brazil: AC, AM, CE, PB, RJ; Mexico, Jamaica, Venezuela, Equator, Panama, Colombia, Costa Rica.
Selected examined material : PARAÍBA: **João Pessoa,** Cabedelo, sobre *Terminalia catappa*, 5

[15] for leaves (*folia*) similar to those of *Pyrus* (Rosaceae).

ago. 2001, fl, fr., *C.H.R.dePaula 357* (R, RUSU).
**Comments:** The record of the occurrence of this species for the State of Rio de Janeiro consists only of the citation of the material examined by Eichler (1868), collected by *Blanchett 164*, which still was not possible to examine.

According to Kuijt (1986c) *Phthirusa pyrifolia* is one of the species of Loranthaceae with the widest distribution.

*Phthirusa pyrifolia* was observed and collected in Estado da Paraíba, where it is very frequent in urban areas. It presents a very similar aspect as observed in *Struthanthus marginatus* (Desr.) Bl. in the city of Rio de Janeiro and, in vegetative phase, it could be confused, if it were not for the so common epicortical roots of *S. marginatus* and that they are absent in *P. pyrifolia*. It is used by Indians of Amazônia in the form of a leaf plaster for small hemorrhages (Schultes & Raffauf 1999).

**4. *PSITTACANTHUS*[16]** Mart., Flora 13: 106- 107. 1830.
**Type species:** *Psittacanthus americanus* (L.) Mart., Flora 13: 108. 1830.

EPIPHYTES, glabrous or pilose, parasites on the branches of dicotyledonous trees, connected to the host only by the initial haustorium, monoecious. BRANCHES erect or pendulous, angular or cylindrical when young, cylindrical when adult. LEAVES simple, to coriaceous and extremely rigid, opposite, sub-opposite at times on the new branches, or rarely verticillate, round, ovate, obovate, orbiculate, lanceolate, apex generally obtuse or sharp, at times emarginate, base round, obtuse or cordate. Nervation frequently pinnate, rarely palmate, at times prominent, however generally inconspicuous, except for the main nervation. BUDS straight or recurved, clavate. FLOWERS large, greater that 5 cm in diam., grouped in diads or triads, each flower on a floral cupula, calyculus conspicuous in the majority of the species, pedicellate, bisexual, hexamerous, tepals showy, yellow, orange or red, or red in the lower half and yellow in the upper half (green in *P. corynocephalus* Eichl.), the internal base of tepals in some species are ligulate, reflexed at anthesis. Stamens dimorphic, alternatingly larger and smaller, filaments linear, anthers dorsifixed, versatile, pollen trilobed with granular exine, tricolpate. Style of the same length as tepals, filiform, angular due to pressure of the stamens in the bud, stigma capitate. FRUIT pericarp orange, red or black. Seeds without endosperm, embryo with 2 to many cotyledons.

Among the Loranthaceae occurring in Brazil, *Psittacanthus* is distinguished by the extreme beauty of its large flowers, always of intense coloration. Studies on the pollination in this genus are unknown, however, the flowers have characteristics of pollination for hummingbirds (Trochilideae), except for *P. corynocephalus* Eichl. whose brush-like green flowers are pollinated by bats (E. Fischer, unknown data), at least in the Pantanal south-matogrossense region.

Genus with about 80 species distributed from Mexico to Argentina in most diverse habitats. In Brazil occurs about 40 species, lacking, however, records for the South Region of the country, *P. robustus* being common in the open pasture, *P. cordatus* in the Pantanal and *P. bicalyculatus* in caatingas. *Psittacanthus* is present in the State of Rio de Janeiro as five species, four exclusively forest and, only one, also occurring in Restingas and fens. Of these, two, *P. dichrous* and *P. robustus* are widely distributed in Brazil. *Psittacanthus flavo-viridis* only occurs in Rio de

[16]. of the flowers (*anthus*) reminiscent of a parrot (*psittaco*) for its coloration and form

Janeiro and Minas Gerais; *P. furcatus* is recorded for the Northeast and finally *P. pluricotyledonarius* is endemic to Serra dos Órgãos (RJ).

**Key to the species**

1. Stems pendulous; inflorescences in fascicles; embryos with 14 cotyledons ..... ..... **4. *P. pluricotyledonarius***
1'. Stems erect; inflorescences in umbels, racemes ou pseudo-cymes; embryos with 2-4 cotyledons
2. Stems with longitudinal fendas..... **1. *P. dichrous***
2'. Stems without longitudinal fendas
3. Buds recurved; leaves obovate ..... **2. *P. furcatus***
3'. Buds retuse; leaves ovate, oblong or lanceolate
4. Inflorescences in umbels; embryo with 4 cotyledons. ..... **5. *P. robustus***
4'. Inflorescences in racemes; embryo with 2 cotyledons. ..... **3. *P. flavo-viridis***

**4.1. *Psittacanthus dichrous*[17]** Mart., Flora 13: 108. 1830.
*Loranthus dichrous* Mart. *in* Schultes & Schultes, Syst. Veg. 7:122-123. 1829. **Type:** Brasil, s. loc., *Luschnath* s.n. (holotype M).
*Loranthus americanus* Vell., Fl. Flumin. Ic. 3, tab. 148. 1831(1829), Arq. Mus. Nac. R. Jan. 5:130. 1881.
*Loranthus dichrous* Engl., Bot. Jahrb. 20:123. 1894.
Figures: 14, 15, 17 and 19

PLANTS erect. STEMS angular, branches cylindrical with longitudinal cracks. LEAVES obovate, nerves inconspicuous. PSEUDO-CYMES axillary with 2-3 triads or diads. Floral BUDS recurved. FLOWERS externally red at the base to the middle third and yellow in the upper third, internally yellow in all length. FRUITS ellipsoid, embryo 2-cotyledonous.

**Geographic distribution:** Brazil: AM, PARÁ, PB, PE, BA, MG, ES, RJ, SP.
Selected examined material : RIO DE JANEIRO: **Arraial do Cabo,** restinga de Massambaba, sobre *Garcinia brasiliensis*, 24 abr. 2002, fr., *C.H.R.dePaula 381* (RUSU). **Itaboraí,** a beira do rio Guaraí, sobre *Laguncularia racemosa,* 29 out. 1976, fl., *D.S.D.Araújo 1322* (GUA). **Macaé,** fazenda Imbaíba, 9 maio 1980, fl., *D.S.D.Araújo 3712* (GUA). **Maricá,** restinga de Maricá, 20 maio 1969, fl., s. col. (RUSU 245). **Nova Friburgo,** Lumiar, Toca da Onça, sobre *Psidium guayava*, 2 jan. 2003, fl., *C.H.R.dePaula and A.Rayol 474* (RUSU); *ibidem*, 22°23'33''S_42°19'53''W, 4 jul. 2003, fr., *C.H.R.dePaula and A.Rayol* 503 (RUSU). **Parati,** APA Cairuçú, Laranjeiras, caminho para o Saco de Mamanguá, 7 dez. 1993, fl., *T.U.P.Konno et al. 376* (RB). **Quissamã,** entre Quissamã and a Lagoa Feia, 2 mar. 1956, fl., *H.Sick and L.F.Pabst* s.n. (HB 10756); *ibidem*, a 7 km da entrada do Parque Nacional da Restinga de Jurubatiba, 15 out. 2003, fl., *J.Fontella 3856 and S.Teixeira 126* (R). **Rio de Janeiro,** restinga de Jacarepaguá, sobre *Tapirira guianensis*, 23 out. 1958, fl., *E.Pereira et al. 4320* (HB); *ibidem*, Vista Chinesa, sobre *Ocotea* sp., 10 nov. 1984, fl., *A.P.Duarte* s.n. (GUA 65383). **São João da Barra,** estrada para Gruçaí, 23 mar. 1982, fl., *L.S.Sarahyba et al. 102* (GUA). **Silva Jardim,**

[17] for flowers with two (di) colors (chromus).

Fazenda Novo Horizonte, 50 ms.m., 14 maio 2001, fl., fr., *F.B.Pereira 51/92* (RFA); *ibidem,* Reserva Biológica de Poço das Antas, caminho para posse do Sr. Aristides, 22°30'S_42°15'W, 24 fev. 1994, fl., *L.Sylvestre et al. 1033* (RB). **Teresópolis,** Parque Nacional da Serra dos Órgãos, estrada de saída do Parque, sobre *Tibouchina* sp., jan. 2004, fl., *C.H.R.dePaula* (*vidi vivum*).
**Comments:** In Rio de Janeiro this is the most common species of the genus, occurring in all the vegetal formations, also in the manguezais (D.S.D.Araújo 1322) where there have generally been frew records of "mistletoe." Frequently parasitic on Myrtaceae and Melastomataceae, flowers and fruit borne abundantly. The longitudinal fissures found on the branches assist in the characterization of this taxon.

**4.2. *Psittacanthus flavo-viridis*[18]** Eichl. *in* Mart., Fl. bras. 5(2): 25, pr. 10, fig.4. 1868. **Type:** Brasil, s. loc., *Gardner 435* (lectotype P, designated by Kuijt 1994).
*Isocaulon flavo-viride* Tiegh., Bull. Soc. Bot. France 42: 352. 1895
Figures: 16, 17 and 19

PLANTS erect. STEMS quadrangular, branches cylindrical without longitudinal cracks. LEAVES ovate-oblong or lanceolate, pinnate-reticulate nerves prominent. RACEMES terminal with 2-4 pairs of triads, buds straight. FLOWERS red, external yellow internally. FRUITS elipsoidal, embryo 2-cotyledonous.

**Geographic distribution:** Brasil: MG, SP, RJ.
**Selected examined material:** RIO DE JANEIRO: **Nova Friburgo,** Macaé de Cima, sítio Sophronites, 22°00'S_42°03'W, 1100 ms.m., 18 ago. 1987, fr., *S.V.A.Pessoa et al. 247* (F, K, RB, UEC). **Itatiaia,** km 13, 10 dez., fl., *C.Porto* s.n. (RB 28096); *ibidem*, caminho para Três Picos, 1040 ms.m., 8 nov. 1993, fl., *R.Guedes-Bruni et al. 2302* (RB); *ibidem*, margem do rio Taquaral, sobre Melastomataceae, s.d., fl., *C.Porto* s.n. (RB 25899); *ibidem*, próxima à cachoeira "Véu de Noiva", nov. 1998, fl., *C.H.R.dePaula* (*vidi vivum*). **Teresópolis,** matas do rio Jacó, sobre "canela-cedro" (Lauraceae), 13 mar. 1949, fl., *C.T.Rizzini 499* (HPN, HBR, RB); *ibidem,* Parque Nacional da Serra dos Órgãos, trilha para Pedra do Sino, sobre Lauraceae, 22 nov. 2003, fl., *C.H.R.dePaula et al.* 513 (HPN, R, RUSU); *ibidem*, vale do Lucas, sobre Lauraceae, 12 mar. 1982, fl., *M.R.Barbosa and Tokitika 301* (GUA). **Rio de Janeiro,** Serra da Carioca, 700 ms.m., 4 fev. 1929, fl., *P.Occhioni* s.n. (RB 25644).
**Comments:** Common only in the Matas from 800 ms.m., very frequent species in the cities of Itatiaia and Teresópolis. It flowers abundantly and at this time, the forest floor directly below of individuals of this species is replete with unopened fallen buds, as well as segments of the perigone of those that had opened and, in the Mata seen from above (e.g. from the apex of a mount) one observes diverse "vermillion spots" scattered in the canopy, announcing the presence of this plant. Extremely distinct from its congeners that also occur in the State, by its leaves with prominent pinnate nerves.

[18] flavo = yellow, viridis = recent (figurative sense), for the yellow interior of the corolla tube that is only revealed at anthesis. [green turning yellow with maturity]

**4.3. *Psittacanthus furcatus*[19]** Mart. *in* Flora 13: 108. 1830.
*Loranthus furcatus* Mart. *in* Schultes & Schultes, Syst. Veg. 7:126-127. 1829. **Type:** Brasil, Bahia, nas matas do rio São Francisco and outros lugares da Bahia. *Martius* s.n. (holotype M).
Figure: 20

PLANTS erect. STEMS strongly quadrangular, branches cylindrical. LEAVES obovate, nerves inconspicuous. PSEUDOCYMES axillary with 2, 3 triads or diads. BUDS recurved. FLOWERS red at the base up to the middle third and the remaining yellow. FRUITS elipsoidal, embryo 2-cotyledonous.

**Geographic distribution:** Brazil: PE, BA, ES, MG, RJ.
Selected examined material : RIO DE JANEIRO: **Rio de Janeiro,** s.loc., s.d., fl., *J.G.Kuhlmam 31* (RB).
**Additional selected material:** BAHIA: **Camamú,** s.loc., 1 mar. 1967, fl., *R.P.Belém and R.S.Pinheiro 3367* (RB). MINAS GERAIS: **Lagoa Grande,** BR-3, km 421, set. 1960, fr., *L.Roth 14686* (RB). ESPÍRITO SANTO: **Linhares,** Reserva da Cia. Vale do Rio Doce, 19 set. 1987, fr., *C.Farney and E.Costa 1682* (RB).
**Comments:** A widely recorded species for the Northeast Region of Brazil. The indication for Rio de Janeiro was made by Fogaça (1996) on the basis of fragmentary material, whose determinador is unaware of, consisting only of a small slightly quadrangular terminal branch with a few floral buds, different from other material analyzed from other States, where the stems are strongly quadrangular. Moreover it is a species very similar to *P. dichrous*.

**4.4. *Psittacanthus pluricotyledonarius*[20]** Rizz., Rodrig. 18-19:140, fig. 9. 1956. **Type:** Brasil, Rio de Janeiro, estrada Rio-Petrópolis, Km 60. *A.Pereira 1499* (holotype RB!)
Figures: 16 and 19

PLANTS pendulous. STEMS and branches cylindrical. LEAVES oblong, nerves inconspicuous, except for the main one that is prominent. FASCICLES axillary consisting of only one triad or diad. BUDS recurved. FLOWERS externally red from the base to the insertion of filaments, on the remain yellow and internally yellow. FRUITS round, embryo 14-cotyledonous.

**Geographical distribution:** Brasil: RJ.
**Selected examined material:** RIO DE JANEIRO: **Nova Friburgo,** Macaé de Cima, picada para Pedra Bicuda, 16 dez. 1991, fl., *M.Nadruz et al. 720* (RB); *ibidem*, nascente do rio das Flores, 1150-1200 ms.m., 23 jun. 1988, fr., *H.C.Lima et al. 3404* (RB). **Petrópolis,** estrada Rio-Petrópolis Km 60, parasitizing *Couepia* sp., 1948, fl. and fr., *A.P.Duarte* s.n. (RB 64491). **Teresópolis,** margem do rio Barreiras, sobre Myrtaceae, 3 out. 2003, fl., fr., *C.H.R.dePaula et al. 510* (HPN, R, RUSU); *ibidem*, BR-116, km 87, Olhos D'Água 900 ms.m, s.d., fr., *A.M.S.F.Vaz et al. 524* (RB).
**Comments:** plant Extremely abundant in the Matas of the Serra dos Órgãos, city of Teresópolis, where it inhabits altitudes of 1,000 up to 1,800 ms.m., on diverse hosts. The tip of the branches

[19] from furcatura = for the bifurcations of the branches and inflorescences.
[20] with many (*pluri*) cotyledons.

and respective young leves presents a medium brown coloration when it is budding. It has been observed that small Troquilídeos of the genus *Hylocharis* (*Hylocharis* cf. *chrysura*) visit to the flowers. It was observed that tepals are red at the base to the height where filaments detach, from there, are yellow and filaments, free, red, in the bud; a dilation in the tube, corresponds to this point of detachment.

**4.5. *Psittacanthus robustus*[21]** Mart., Flora 13: 108. 1830.
*Loranthus robustus* Mart. *in* Schultes & Schultes, Syst. Veg. 7:125. 1829. **Type:** Brasil, nos campos da cidade de São Paulo, s.d., *Martius* s.n. (lectotype M, foto Field Mus. 19062, designated by Kuijt 1994).
*Loranthus grandiflorus* Vell., Fl. Flumin. Ic. 3, tab. 147. 1831(1829), Arq. Mus. Nac. R. Jan. 5:130.1881.
*Psittacanthus intermedius* Rizz., Rev. Fac. Agron., Maracay, 8 (3): 94. 1975.
Figures: 18, 19 and 20

PLANTS Erect. STEMS strongly quadrangular, branches cylindrical. LEAVES ovate, nerves imperceptible. UMBELS terminals, flowers in triads. BUDS straight. FLOWERS external and internally yellow or orange. FRUITS elliptical, embryo 4-cotyledonous.

**Geographic distribution:** Brazil: AM, PARÁ, TM, GO, DF, BA, MG, RJ, SP; Venezuela.
**Selected examined material** : RIO DE JANEIRO: **Nova Friburgo,** Macaé de Cima, s.loc., 22°00'S_42°03'W, sobre *Vochysia* sp., 30 out. 1990, fl., *H.C.Lima et al. 4007* (RB, SP). **Teresópolis,** Parque Nacional da Serra dos Órgãos, sobre *Vochysia oppugnata*, nov. 2002, fl., *C.H.R.dePaula* 528 (RUSU).
**Comments:** This is probably the most common species of Psittacanthus to occur in Brazil, widely collected in the open pasture, mainly the miner, having a notable affinity for Vochysiaceae (Vochysia spp. and Qualea spp.). It still has diverse collections proceeding from Hiléia Amazonian, being less represented in the Atlantic Mata formation. The strong quadrangular stems and the long yellow flowers characterize the species.

**5. *STRUTHANTHUS*[22]** Mart., Flora 13: 102-103. 1830.
**Type:** *Struthanthus syringifolius* (Mart.) Mart. *in* Flora 13: 105. 1830.

Glabrous or pilose EPIPHYTES, parasites on branches and stems of gymnosperms, dicotyledons and arborescent monocotyledons, dioecious. BRANCHES erect and/or semi-pendulous, always with epicortical roots or plants of complex habit always with adventitious roots, stems angular or cylindrical when young, cylindrical when adult, lenticels generally present, at times in great amounts. LEAVES simple, always opposite, sub-opposite at the apices of new branches, the young of some species have an initial development bending in the form of a hook (hamato-curvadas); elliptical, ovate, obovate or oval, blades amphistomatous, lanceolate, or hypostomatous, nerves pinnate always conspicuous. INFLORESCENCES axillary or terminal in racemes, spikes, corymbs or glomerules. Floral BUDS typically clavate, the male larger than the female ones. FLOWERS small, ca. 1.0-1.5 cm in diam., sessile or pedunculate, arranged in triads

[21] for the robustness of the plant as a whole.
[22] *Struthios* = sparrow, *anthus* = flower.

on a trilocular cupula, present in the majority of the species, formed by the fusion of the bracts of each flower. Perigone (4-5-)6-merous, tepals white-greenish, reflexed at anthesis. The male with dimorphic stamens, filaments not-indented laterally, anthers dorsifixed, versatile, pollen grains triangular, exine granular, tricolpate or triporate, pistillode filiform present or not. The female ones recorded with a nectary ring, style straight or twisted, stigma ovoid, staminodes present composed of thin filaments and anthers that are always atrophied, white. The flowers are both extremely nectariferous and odoriferous. FRUITS baccoid, colored yellow, orange, or black, epicarp coriaceous, with a layer of white viscin, seed chlorophyllous with endosperm, embryo 2-cotyledonous.

*Struthanthus* is a genus of essentially sun-loving plants, having exceptions as *S. vulgaris* and *S. andrastylus*, that have been observed growing in the shade. Parasitizing mainly dicotyledons, they are also found, however, on arborescent monocotyledons (Rizzini 1951) such as some "bamboos" (Poaceae, subfamily Bambusoideae) and *Pandanus* sp. (Pandanaceae). The white or white-greenish flowers are small (up to 1 cm), without a tube and extremely odoriferous, indicating bee pollination and, in fact, many times swarms of European bees (*Apis melifera*) have been observed visiting its flowers, without, however, it being tested if they are real pollinators or only pilferers of nectar and/or pollen.

The genus, centered in South America, is of uncertain size, with estimates being around 60-70 species occurring from Mexico to Argentina (Abbiatti 1946; Rizzini 1982). In Brazil about 46 species occur (Rizzini 1950, 1956) in all the States and ecosystems. In the State of Rio de Janeiro 17 species and six varieties had been found that are distributed from the littoral vegetation to the high altitude Mata.

**Key to the species**

1. Plants erect or semi-pendulous
2. Flowers sessile
3. Racemes ..... **15. *S. syringifolius***
3'. Spikes ..... **13. *S. salicifolius***
2'. Flowers pedunculate
4. Racemes ..... **12. *S. rhynchophyllus***
4'. Umbels ..... **17. *S. vulgaris***
1'. Plants of complex habit
5. Young leaves falcate (hamato-curvadas)
6. Corymbs ..... **11. *S. polyrhizus***
   a. leaves oblong, at base lanceolate, apex obtuse or rounded
   ..... **11.1. *S. polyrhizus* var. *oblongifolius***
6'. Racemes
7. Leaf base auriculate ..... **14. *S. staphylinus***
   a. leaves oblong or oblong-lanceolate ..... **14.1. *S. staphylinus* var. *palifolius***
7'. Without these characteristics ..... **6. *S. flexicaulis***
5'. Young leaves not falcate (hamato-curvadas)
8. Branches compressed or quadrangular
9. Pistillode absent from the male flowers
10. Racemes ..... **1. *S. andrastylus***
10'. Umbels ..... **16. *S. uraguensis* var. *uraguensis***
9'. Pistillode present in the male flowers

11. Perigone pentamerous ..... **10. *S. pentamerus***
11'. Perigone hexamerous
12. Glomerules..... **4. *S. confertus***
12'. Umbels ..... **1.1. *S. andrastylus* var. *stylandrus***
12''. Racemes
13. Leaves auriculate..... **5. *S. dorothyi***
13'. Leaves not auriculate ..... **8. *S. marginatus***
a. stems strongly quadrangulares ..... **8.1. *S. marginatus* var. *friburgensis***
b. leaves ovate-lanceolate ..... **8.2. *S. marginatus* var. *oval-lanceolatus***
c. racemes combined into panicles ..... **8.3. *S. marginatus* var. *paniculatus***
8'. Branches cylindrical
14. Margins of leaves finely serrate. ..... **2. *S. armandianus***
14'. Without these characteristics
15. Glomerules
16. Leaves amphistomatous ..... **9. *S. maricensis***
16'. Leaves with stomates present only on the abaxial face ..... **7. *S. glomeriflorus***
15'. Spikes ..... **3. *S. concinnus***

**5.1.*Struthanthus andrastylus*[23]** Eichl. *in* Mart., Fl. bras. 5(2): 69, pr. 28, fig. 4 .1868. **Type:** Brasil, s.loc., *Riedel & (Landorff?)* s.n. (lectotype C, foto Field Mus. 21395, designated by Kuijt 1994).
Figures: 21 and 22.

PLANTS of complex habit. STEMS compressed, branches cylindrical. LEAVES not hook-shaped [falcate], adult oblong-obovate, slightly anti-symmetrical, apex obtuse or round, base decurrent, non-cartilaginous margin, amphistomatous young. RACEMES with the sessile flowers, grouped in triads on trilocular cupula, perigone hexamerous; pistillode absent in the male flowers.

**Geographic distribution:** Brasil: MG, RJ, SP.
**Selected examined material:** RIO DE JANEIRO: **Itatiaia,** estrada para sede nas Prateleiras, sobre Compositae, 29 jul. 1999, fl., *C.H.R.dePaula et al. 187* (RUSU). **Nova Friburgo,** Lumiar, estrada para Macaé de Cima, sobre *Casearia sylvestris*, 23 maio 2000, fl., *C.H.R.dePaula 235* (RUSU). **Petrópolis,** Carangola, mar. 1943, fl., *D. Constantino and C. Góes* s.n. (RB 51443). **Rio Claro,** Lídice, Sítio da Barra, 25 nov. 2001, bt., fl., fr., *F.M.B.Pereira 08/129* (RFA). **Santa Maria Madalena,** Parque Estadual do Desengano, em Melastomataceae, 20 dez. 1988, fl., *G.Martinelli et al* 13226 (RB). **Teresópolis,** Parque Nacional da Serra dos Órgãos, trilha para Pedra do Sino, sobre Melastomataceae, 3 jun. 1999, fl., *C.H.R.dePaula and A.Lobão 175* (RUSU), *ibidem*, Km 1, sobre *Cassia multijuga*, 5 out. 1948, bt., *C.T.Rizzini 379* (HPN).
**Comments:** Very common plant in the serrana region of the State where it inhabits the Matas between 800 and 1500 ms.m. It is very common to observe individuals attached to the host trunks, therefore, in shady conditions.

[23] for the presence of a pistillode in the staminate flowers.

**5.2. *Struthanthus armandianus*[24] Rizz.,** Ernstia 32: 4, figs. 1,2. 1985. **Type:** Brasil, Rio de Janeiro, Saquarema, fazenda Toca do Vento, sobre *Apuleia leiocarpa*, 21 out. 1982, fl., *C.T.Rizzini and A.Mattos-Filho* s.n. (holotype RB!)
Figure: 21

PLANTS of complex habit. STEMS and branches cylindrical. Young LEAVES not falcate (hamato-curved), adult oblong-obovate, acute apex, base attenuate, margin finely serrate, amphistomatous. GLOMERULES with the sessile flowers, grouped in triads on a trilocular cupula, perigone tetramerous; pistillode present in the male flowers.

**Geographic distribution:** Brazil: RJ.
**Comments:** In the original work, Rizzini (1985) has a photograph in which he observed two pairs of inflorescences with diverse flowers, however, the type material analyzed in the RB although in agreement with the cited notations on the label to the original work, it does not have such flowers, in truth, it appears to be only in the vegetative phase, except for a small remaining bud. Extremely distinct species among the other congeners for having a tetramerous perigone and the serrate margin of the leaves.

**5.3. *Struthanthus concinnus*[25]** Mart., Flora 13: 105. 1830.
*Loranthus concinnus* Mart. *in* Schultes & Schultes, Syst. Veg. 7:150. 1829. **Type:** Brasil, nas matas de Alto Amazonas, *Martius* s.n. (holotype M).
Figures: 21 and 22

PLANTS of complex habit. STEMS and branches cylindrical, densely lenticelate. Young LEAVES not hamato-bending, adult lanceolate or ovate-lanceolate, apex acuminate, base round, margin non-cartilaginous, amphistomatous. SPIKES with the sessile flowers, grouped in triads on trilocular cupula, perigone hexamerous; pistillode present in the male flowers.

**Geographic distribution:** Brasil: SP, RJ.
**Selected examined material:** RIO DE JANEIRO: **Itatiaia,** Parque Nacional do Itatiaia, estrada do registro, sobre Euphorbiaceae, 12 dez. 1975, fr., *P.Occhioni 7863* (RB, RFA, RUSU); *ibidem*, Maromba, trilha para cachoeira Itaporani 1050 ms.m., 21 nov. 1994, bt., *J.M.A.Braga et al. 1558* (RB). **Nova Friburgo,** Lumiar, estrada para Macaé de Cima, sítio Flor da Montanha, 10 fev. 2001, fl., *C.H.R.dePaula 317* (RUSU). **Parati,** estrada de Parati-Mirim, 8 ago. 1994, fr., *R.Marquete et al. 1954* (RB). **Resende,** Visconde de Mauá, 16 maio 1972, fl., *P. Occhioni 4873* (RB, RFA, RUSU). **Rio Claro,** Lídice, 580 ms.m., 12 jan. 2002, fl., *F.M.B.Pereira 12/141* (RFA). **Teresópolis,** Parque Nacional da Serra dos Órgãos, trilha para Pedra do Sino, 3 jun. 1999, fr., *C.H.R.dePaula and A.Lobão 177* (RUSU), *ibidem*, bosque Santa Helena, sobre *Tetrapterys* sp., 23 nov. 1948, fr., *C.T.Rizzini 398* (HPN). **Valença,** distrito Dois Irmãos, fazenda Dois Irmãos, 1 maio 2000, fr., *F.M.B.Pereira 338* (RFA).
**Comments:** Plant very common in the serranas regions of the State, easily identifiable by the combination by the densely lenticelate branches, lanceolate leaves and inflorescences in spikes. According to Corrêa (1969) known as "small-leaved mistletoe" [erva-de-passarinho-de-folha-

[24] in honor of the botanist Armando de Matos Filho, collector of the holotype.
[25] *concinnus* = elegant, beautiful, harmonious.

miúda].

**5.4. *Struthanthus confertus*[26]** Mart. Flora 13: 104. 1830.
*Loranthus confertus* Mart. *in* Schultes & Schultes, Syst. Veg. 7:121-122. 1829. **Type:** Brasil, s.loc., *Wied-Neuwied* (holotype BR).
Figures: 21 and 22

PLANTS of complex habit. STEMS compressed, branches cylindrical. Young LEAVES not hamato-bending, adult orbiculate, apex shortly acuminate, base round, margin non-cartilaginous, amphistomatous. GLOMERULES with the sessile flowers, grouped in pedunculate triads, on trilocular cupula, perigone hexamerous; pistillode present in the male flowers.

**Geographic distribution:** Brasil: GO, RJ.
**Selected examined material:** RIO DE JANEIRO: **Maricá,** restinga de Maricá, sobre *Coccoloba* sp., 14 jun. 2000, fr., *C.H.R.dePaula et al. 249* (RUSU). **Silva Jardim,** margens do rio São João, 22°30'S_42°19'W, 30 out. 1992, fl., *M.Peron et al. 981* (RB).
**Additional selected material:** GOIÁS: **Teresina,** estrada para Alto Paraíso, 11 out. 1979, fl., *E.P.Heringer et al 2492* (RB).
**Comments:** Plant common in Restingas. Very near to *S. maricensis* mainly differing from it by possessing sessile triads.

**5.5. *Struthanthus dorothyi*[27]** Rizz., Revta. Bras. Biol.51 (2): 457, fig. 2.1991. **Type:** Brasil, Rio de Janeiro, município de Macaé, restinga de Cabiúnas, 19 jan. 1984, flores verdes, *D.S.D.Araújo and G.V.Sommer 5935* (holotype GUA!).
Figure: 21

PLANTS of complex habit. STEMS quadrangular, branches cylindrical. Young LEAVES not hamato-bending, adult oblong, apex obtuse, base cuneate, slightly auriculate, margin non-cartilaginous, amphistomatous. RACEMES with sessile flowers, grouped in triads on trilocular cupula, perigone hexamerous; pistillode present in the male flowers.
**Geographic distribution:** Brasil: RJ.
**Comments:** Species known only from the type material and, therefore, endemic from the typical locality.

**5.6. *Struthanthus flexicaulis*[28]** Mart., Flora 13: 105. 1830.
*Loranthus flexicaulis Mart. in* Schultes & Schultes, Syst. Veg. 7:139. 1829. **Type:** Brasil, Minas Gerais, nos Campos de Tabuleiro, *Martius* s.n. (holotype M).
Figure: 24

PLANTS of complex habit. Quadrangular STEMS, cylindrical branches. Hamato-bending, adult young LEAVES ovado-elliptical, acute apex, cuneate base, non-cartilaginous margin,

[26] *confertus*= dense, aggregated, compact (the agglomerated flowers).
[27] in honor of the ecologist Dr. Dorothy S. D.Araújo da Universidade Federal do Rio de Janeiro, collector of the holotype.
[28] for the flexible stems.

hypostomatous. RACEMES with the sessile flowers, grouped in triads on cupula to trilocular, perigone hexamerous; absent pistillode in the male flowers.

**Geographic distribution:** Brasil: BA, GO, DF, MG, ES, RJ, SP.
**Selected examined material:** RIO DE JANEIRO: **Rio de Janeiro,** s.loc., ago. 1889, bt., *Ule* s.n. (RB 67405).
**Additional selected material:** GOIÁS: **Corumbá de Goiás,** Serra dos Pirineus, 30 nov. 1965, fr., *H.S.Irwin et al*. 10770 (RB). DISTRITO FEDERAL: **Brasília,** RECOR, em Sapotaceae, s.d., fr., *E.P.Heringer2841* (RB). MINAS GERAIS: **Belo Horizonte,** Serra do Espinhaço, sobre Myrtaceae, 12 fev. 1968, fl., *H.S.Irwin et al. 19941* (RB). **Serra do Cipó,** sobre *Phoradendron* and este sobre *Miconia*, 20 dez. 1979, fl.,fr., *A.P.Duarte et al. 2406* (RB). BAHIA: **Seabra,** Serra da Água de Rega, estrada para Água de Rega, sobre *Mimosa*, 25 fev. 1971, fr. *H.S.Irwin et al. 30989* (RB). ESPÍRITO SANTO: **Linhares,** Reserva Florestal Companhia Vale do Rio Doce, sobre *Myrcia*, 9 fev. 1999, fl., *B.L.Stannard et al. 1011* (RB). SÃO PAULO: **São Paulo,** Reserva Florestal da Cidade Universitária, sobre *Mimosa*, 11 mar. 1983, bt., *C.Zerbinati* s.n. (RB 314198).
**Comments:** After Rizzini (1995) a plant characteristic of the fields and cerrados and has only the above records.

**5.7. *Struthanthus glomeriflorus*[29]** Eichl. *in* Mart. Fl., bras. 5(2): 84. 1868. **Type:** Brasil, Bahia, s.loc., *Blanchet 3181* (lectotype P, isotype G, designated by Kuijt 1994).
Figures: 23 and 24

PLANTS of complex habit. STEMS and branches cylindrical. Young LEAVES not hamato-bending, adult oblong-lanceolate, apex acuminate, base round, margin non-cartilaginous, hypostomatous. GLOMERULES with the sessile flowers, grouped in triads on a trilocular cupula; pistillode present in the male flowers.
**Geographic distribution:** Brasil: BA, RJ.
**Selected examined material:** RIO DE JANEIRO: **Teresópolis,** s.loc., 19 out. 1958, bt., *A.G. Andrade 137* (R).
**Comments:** The examined material presented above constitutes the only collection of *S. glomeriflorus* found in the consulted herbaria, the record for Bahia, comes from Eichler (1868).

**5.8. *Struthanthus marginatus*[30]** (Desr.)Bl. **var. *marginatus***, in Schult. F., Syst. 7: 1731. 1830. *Loranthus marginatus* Desr. in Lam., Encyc. 3. 596. **Type:** Peru, s.loc., *H. Ruiz and R. Pavon 9131* (holotype MO). *Loranthus vulgaris* Vell., Fl. Flumin.:130, Ic. 3, tab. 145. 1831(1829), Arq. Mus. Nac. R. Jan. 5:130. 1881.
Figures: 23 and 24

PLANTS of complex habit. STEMS quadrangular, branches cylindrical. Young LEAVES not hamato-bending, adult ovate or elliptical, apex acute, obtuse base, margin cartilaginous, amphistomatous. RACEMES with the sessile flowers, grouped in triads on trilocular cupula, perigone hexamerous; pistillode present in the male flowers.

[29] for flowers in glomerules.
[30] *marginatus*=marginal (of the cartilaginous margin of the leaves).

**Geographic distribution:** Brasil: PB, PE, BA, MG, RJ; Peru, Panamá, Costa Rica.
**Selected examined material:** RIO DE JANEIRO: **Angra dos Reis,** Ilha Grande, R. B. E. Praia do Sul, praia do Aventureiro, 22 nov. 1990, *W.L.Araújo 160 and R.R.Oliveira* (GUA). **Caxias,** Reserva da Petrobrás, 22°33'S_43°16'W, margem da represa, sobre Leguminosae, 30 mar. 1999, fl., fr., *C.H.R.dePaula et al. 159* (RB). **Itaguaí,** campus da UFRRJ, sobre Lythraceae, 10 set. 1990, fl., *J.Figueira 100* (RBR). **Itatiaia,** Fazenda da Cruz, trilha do Mata Cavalo, 22°15'S_44°34'W, 1350 ms.m, 16 mar. 1995, fr., *J.M.A.Braga et al. 2145* (RB). **Mangaratiba,** Reserva Rio das Pedras, trilha para o viveiro de mudas, sobre *Piptadenia gonoacantha*, 13 jun. 2000, fr., *C.H.R.dePaula et al. 242* (RUSU). **Mendes,** Fazenda São José das Paineiras, 12 set. 1993, fl., *T.U.P.Konno et al. 307* (RUSU). **Niterói,** Itaipuaçú, Pico do Alto Moirão, 20 out. 1981, fr., *R.H.P.Andreata and A.S.F.Vaz 117* (RUSU). **Nova Friburgo,** Lumiar, rua atrás da praça principal, sobre *Citrus* sp.**,** 23 maio 2000, fr., *P.Pinto and T.Fernandes 9* (RUSU). **Parati,** fazenda Olaria, beira da estrada, 6 jul. 1992, fl., *L.C.Giordano et al. 1458* (RB). **Petrópolis,** Vale do Bonfim, estrada para o Alcobaça, 1200 ms.m., sobre *Securidaca* sp., 22 ago. 1998, bt., *J.M.A.Braga 5026* (RUSU). **Resende,** Porto Real, rio Paraíba do Sul, sobre *Inga* sp., 22 out. 1981, bt., fl., *J.P.P.Carauta et al 3873* (GUA). **Rio de Janeiro,** Botafogo, campus da Universidade Santa Úrsula, sobre *Mangifera indica*, 17 set. 1999, fl., *C.H.R.dePaula 194* (RUSU).
**Comments:** The most common species of Struthanthus, an extremely generalist in relation to hosts, however, one can note an intense development on exotic plants. People use it to cure bronchitis. According to Corrêa (1969) known as the "large-leaved mistletoe" ["erva-de-passarinho-de-folha-grande"].

**5.8.1.** ***Struthanthus marginatus*** **var.** ***friburgensis***[31] Rizz., Revta. Bras. Biol. 51 (2):456. 1991.
**Type:** Brasil, Rio de Janeiro, Nova Friburgo, Sanatório Naval, 29 jul. 1987, fr., *M.C.Viana et al. 1816* (holotype GUA!). Teresópolis, estrada Teresópolis-Friburgo, km 9, 30 jul. 1985, fr., *H.F.Martins et M.C.Viana 1753* (parátipo GUA!); Barra do Piraí, estrada Barra do Piraí-Valença, km 53, 04 mar. 1980, fr., *M.B.Casari et al. 179* (parátipo GUA!).
Figure: 23

It is distinguished from the typical variety by the strong quadrangular branches, that soon become cylindrical.

**Geographic distribution:** Brasil: RJ.
**Comments:** *Struthanthus marginatus* always presents the quadrangular stems that, however, quickly become cylindrical. In this variety the branches are strongly quadrangular, moreover it exactly agrees to the variety *marginatus*. Once the type collections of this variety are known it can be considered endemic to the State of Rio de Janeiro.

**5.8.2.** ***Struthanthus marginatus*** **var.** ***oval-lanceolatus***[32] Rizz., Rev. Bras. Biol. 10(4): 401. 1950.
**Type:** Brasil, Rio de Janeiro, Teresópolis, na Serra dos Órgãos, s.d., *C.T.Rizzini 279* (holotype RB).
Figure: 23

[31] for Nova Friburgo (RJ), locality of the type of the variety.
[32] for the ovate-lanceolate leaves of the variety.

It differs from the typical variety by the ovate-lanceolate leaves, while leaves in the other are only lanceolate or elliptical.
**Geographic distribution:** Brasil: RJ.
**Comments:** The type material of this species was not located, of utmost importance for understanding the parameters used by the author in defining this taxon. Distinguishing characters of this variety pointed out the author of the original work were not enough to allow new determination to be done, due to foliar plasticity of this species.

**5.8.3.** ***Struthanthus marginatus*** **var.** ***paniculatus***[33] Eichl. *in* Mart., Fl. bras. 5(2): 77, pr.22. 1868. **Type:** Brasil, s.loc., *Martius 474* (lectotype M, designated by Kuijt 1994 ).
Figure: 23

It differs from the typical variety by the paniculate inflorescences while that in the typical variety there are simple racemes.
**Geographic distribution:** Brasil: RJ.
**Selected examined material:** RIO DE JANEIRO: **Teresópolis:** Parque Nacional da Serra dos Órgãos, 1000 ms.m., 31 ago. 1948, bt., *C.T.Rizzini 357* (RFA).
**Comments:** The examined material, cited above, at present consists only of the unicate in the consulted herbaria.

**5.9.** ***Struthanthus maricensis***[34] Rizz., Leandra 2(3):76.1972. **Type:** Brasil, Rio de Janeiro: Maricá, Barra de Maricá, restinga, 30 out. 1971, *C.T.Rizzini s.n.* (holotype RB)
Figures: 25 and 27

PLANTS of complex habit. STEMS and branches cylindrical. Young LEAVES not hamato-bending, adult ovate, apex shortly acuminate, base round, margin non-cartilaginous, amphistomatous. GLOMERULES with the sessile flowers, grouped in sessile triads on trilocular cupula, perigone hexamerous; pistillode present in the male flowers.

**Geographic distribution:** Brasil: RJ.
**Selected examined material:** RIO DE JANEIRO: **Maricá,** restinga de Maricá, sobre *Clusia* sp., 22 jun. 2003, fr., *C.H.R.dePaula 492* (RUSU), *Ibidem*, picada da Aeronáutica, 27 mar. 1988, fl., *F.Agarez et al. 27* (RFA), *Ibidem*, área de moita, parasitizing Celastraceae, 4 jul. 1988, fr., *C.Pereira s.n.* (RFA 22238), *ibidem*, sobre *Guapira*, 24 out. 1986, fl., *L.C.Giordano et al. 169* (RB).
**Comments:** In the original work on the species, the author does not mention the type material, however, Profice (1991) relates the material of the species mentioned above as holotype according to a verbal communication by the author. Because of the fact that the citation did not contain the exemplar type in the protolog, the name, according to International Code of Botanical Nomenclature (Greuter et al. 2000), is illegitimate. In this way, in the future it must be legitimized for future use of the binomial.

[33] for the inflorescence in panicles of the variety.
[34] proceeding from Maricá (RJ), the type locality.

**5.10.** ***Struthanthus pentamerus***[35] Rizz., Rev. Brasil. Biol. 10 (4): 401.1950. **Type:** Brasil, Rio de Janeiro, Serra dos Órgãos (PNSO), abrigo 2, 1600 ms.m., 26 maio 1949, *C.T.Rizzini 511* (holotype RB!, isotypes HPN, NY)
Figure: 25

PLANTS of complex habit. STEMS slightly compressed, branches cylindrical. Young LEAVES not hamato-bending, adult oblong, apex acute, base acute, decurrent, margin non-cartilaginous, hypostomatous. RACEMES with the sessile flowers, grouped in triads on trilocular cupula, perigone hexamerous, pistillode present in the male flowers.

**Geographic distribution:** Brasil: RJ.
**Selected examined material:** RIO DE JANEIRO: **Itatiaia,** estrada para as Prateleiras, sobre *Compositae*, 29 jul. 1999, fl., *C.H.R.dePaula et al. 188* (RUSU); *ibidem,* entre Massenas and Macieiras, 13 jan. 1961, fl., fr., *A.Castellanos 23134* (GUA), *ibidem,* Planalto, 2000-2200 ms.m., em *Compositae*, 13 maio 1963, fl., *E.Pereira 7563 and C.Pereira 31* (RB). **Teresópolis,** matas do Abrigo 2 (1650 ms.m.), 26 maio 1949, fl., *C.T.Rizzini 511* (HPN).
**Comments:** Flowering material easily determined by the pentamerous perigone, rare in the group.

**5.11.** ***Struthanthus polyrhizus***[36] Mart. var. ***polyrhizus***, Flora 13: 105. 1830.
*Loranthus polyrhizus* Mart. *in* Schultes & Schultes, Syst. Veg. 7:139-140. 1829. **Type**: Brasil, Bahia, no rio das Almas, *Martius* s.n. (M, foto Field Mus. 19038).
Figures: 26 and 27

PLANTS of complex habit. STEMS quadrangular, branches cylindrical. Young LEAVES hamato-bending, adult obovate, apex emarginate with small mucro, base decurrent, margin non-cartilaginous, amphistomatous. CORYMBS with the sessile flowers, grouped in triads on trilocular cupula, perigone hexamerous; pistillode absent in the male flowers.

**Geographic distribution:** Brasil: PA, PI, CE, PE, AL, BA, GO, MA, MG, RJ, SP, SC.
**Additional selected material:** BAHIA: **Piatã,** estrada à direita da via Piatã–Boninal, sobre *Mimosa* sp., 14 fev. 1987, fl., *R.M.Harley et al 24222* (RB), **Salvador,** área de Pituaçú, sobre coqueiro, 15 fev. 1992, fl., *H.P.Bautista 1615* (RB). ESPÍRITO SANTO: **Linhares,** Reserva Florestal Companhia Vale do Rio Doce, sobre Mimosoideae, 9 fev. 1999, bt., fl., *B.L.Stannard et al. 1009* (RB). GOIÁS: **Dianópolis,** Almas, sobre *Byrsonima* sp., 11 fev. 1987, fr., *J.R.Pirani et al. 1919* (RB). MARANHÃO: **Mineirinho,** rio Pindaré, 30°40'S_45°50'W, 14 dez. 1978, fl., *J.Jangoux and R.P.Bahia 506* (RB). MINAS GERAIS: **Santana do Riacho,** s.loc., 5 nov. 1983, bt., *M.G.M.Arraes et al. 120* (RB).
**Comments:** The occurrence of this species in the State of Rio de Janeiro is based on the commentary of Eichler (1868) concerning the distribution of the species and on the listing of Fogaça (1996). The only material with such determination found in herbarium, G.Martinelli 13226 deposited in RB, was identified in the present study as S. andrastylus.

[35] from the flower with 5 tepals.
[36] from many (*poly*) roots (*rhizus*).

**5.11.1.** ***Struthanthus polyrhizus*** var. ***oblongifolius***[37] Eichl. in Mart., Fl. bras., 5(2): 71. 1868.
**Type:** Brasil, São Paulo, s.loc., s.d., *Burchell 4090* (lectotype BR, isolectotype P; designated by Kuijt 1994)
Figure: 25 and 26

It differs from the typical variety by its oblong to at times lanceolate leaves and by a generally obtuse or round leaf apex.

**Geographic distribution:** Brasil: MG, RJ, PR, SC, RS.
**Selected examined material:** RIO DE JANEIRO: **Teresópolis,** Parque Nacional Serra dos Órgãos, s.d., *Sampaio 1936* (R).
**Additional selected material:** MINAS GERAIS: **Belo Horizonte,** Serra do Itabirito, sobre Compositae, 12 fev. 1968, bt., fl., *H.S.Irwin et al. 19973* (RB). RIO GRANDE DO SUL: **Porto Alegre,** Torres, morro Azul, sobre *Alchornea triplinervea*, 20 dez. 1978, fl., *Waechter 1098* (RB). SANTA CATARINA: **Lajes,** s.loc., sobre *Sebastiana klotzchiana*, 10 jan. 1951, bt., fl., *B.Rambo 49618* (RB), **Ibirana,** horto florestal do INP, 400 ms.m., 13 maio 1956, bt., *R.Reitz and R.Klein 3132* (RB).
**Comments:** Amongst the varieties presented in this work, the present one is most distinct in relation to the typical variety. According to Rizzini (1968), the northern limit of this variety is Serra do Cipó (MG) and the same author suggests that such an entity has a certain "preference" for hosts of the families Euphorbiaceae and Solanaceae.

**5.12.** ***Struthanthus rhynchophyllus***[38] Eichl. *in* Mart., Fl. bras. 5(2): 69, pr. 28, fig. 4. 1868.
**Type:** Brasil, Rio de Janeiro, *Gaudichaud 571* (lectotype P, designated by Kuijt 1994).
*Eichlerina rhynchophyllus* Tiegh., Bull. Soc. Bot. France 42: 175. 1895.
Figures: 25 and 26

PLANTS Erect, semi-pendulous. STEMS slightly compressed, branches cylindrical. Young LEAVES not hamato-bending, adult ovate-oblong or lanceolate, apex acuminate, at times with small mucro, base acute, margin non-cartilaginous, amphistomatous. RACEMES with the pedunculate flowers grouped in triads, bracteolar cupula absent, perigone hexamerous; pistillode present in the male flowers.

**Geographic distribution:** Brasil: BA, RJ.
**Selected examined material:** RIO DE JANEIRO: **Cabo Frio,** Armação de Búzios, restinga da Praia Rasa, 15 jan. 1979, fl., *G.Martinelli 5635* (RB). **Campos,** Lagoa de Cima, 6 out. 1980, fr., *D.S.D.Araújo 4040* (GUA). **Macaé,** Fazenda Carreira comprida, 52 ms.m., 6 jan. 2000, fr., *F.M.B.Pereira et al. 1/24* (RUSU; RFA). **Silva Jardim,** Reserva Biológica Poço das Antas, trilha do Pau-preto, 24 jan. 1995, bt., fl., fr., *J.M.A.Braga et al. 1779* (RB; RUSU); *ibidem,* 22°30'S_42°15'W, 23 fev. 1994, fr., *A.Piratininga et al. 44* (RB); *ibidem,* Juturnaíba, à beira do Lagoa, 25 fev. 1981, fl.,fr., *M.B.Casari et al. 450* (GUA).
**Additional selected material:** BAHIA: **Ilhéus,** Centro de Pesquisas do Cacau, 24 mar. 1965, fr., *R.P.Belém and M.Magalhães 517* (RB).

[37] from oblong leaves of the variety.
[38] *rhynco* = snout, beak, from the pointed leaves.

**Comments:** Extremely distinct species amongst the various congeners by the pedunculate flowers, grouped in triads, and these in racemes, similar in structure to that found in *Tripodanthus acutifolius* that it possesses bigger and bisexual flowers.

**5.13. *Struthanthus salicifolius*[39]** Mart., Flora 13(1): 105. 1830.
*Loranthus salicifolius* Mart. *in* Schultes & Schultes, Syst. Veg. 7:102. 1829. **Type:** Brasil, Minas Gerais, nos campos tabuleiros de Ouro Preto, *Martius* s.n. (lectotype M, foto Field Mus. 27838, designated by Kuijt 1994).
Figures: 29 and 30

PLANTS erect, semi-pendulous. STEMS slightly compresssed, branches cylindrical. Young LEAVES not hamato-bending, adult lanceolate, apex acuminate, base attenuated, margin non-cartilaginous, amphistomatous. SPIKES with the sessile flowers grouped in triads on trilocular cupula, perigone tetramerous; pistillode present in the male flowers.

**Geographic distribution:** Brasil: MG, RJ, SP.
**Selected examined material:** RIO DE JANEIRO: **Mendes,** fazenda São José das Paineiras, 10 ago. 1993, fl., fr., *T.U.P.Konno et al. 240* (RUSU). **Nova Friburgo,** serra de Macaé de Cima, em Melastomataceae, 7 mar. 1978, fl., *D.S.D. Araújo et al. 2077* (GUA). **Parati,** APA Cairuçú, Ponta Negra, 12 maio 1994, fl., *R.Marquete et al. 1575* (RB). **Rio de Janeiro,** Mesa do Imperador, sobre *Miconia* sp., 1 jul. 1958, bt., fl., *P.Occhioni 1752* (RFA); *ibidem*, Floresta da Tijuca, estrada Excelsior, entre Caveira and Barracão, 11 jun. 1964, bt., *J.P.P.Carauta 222* (GUA); *ibidem*, atalho que liga Mesa do Imperador ao encanamento, 29 maio 1963, fr., *H.F.Martins 314* (GUA); *ibidem,* Tijuca, 2 jun. 1929, fl., *A.C.Brade 10463* (R). **Teresópolis,** s.loc., maio 1917, fl., *A.J.Sampaio 2198* (R).
**Comments:** Plant easily identified by the tetramerous perigone, a species only between the the State of Rio de Janeiro. Moreover, it presents a cinereous coloration in herbarium material.

**5.14. *Struthanthus staphylinus*[40] var. *staphylinus*** Mart., Flora 13(1): 105. 1830.
*Loranthus staphylinus* Mart. *in* Schultes & Schultes, Syst. Veg. 7:140. 1829. **Type:** Brasil, Amazonas, nas matas no Rio Solimões, Alto Amazônas, *Martius* s.n. (lectotype M, foto Field Mus. 19041; designated by Kuijt 1994).
Figure: 27, 29 and 30

PLANTS of complex habit. STEMS and branches cylindrical. Young LEAVES hamato-bending, adult obovate, rarely oblong, apex round, at times emarginate and with a small mucro, base auriculate, margin non-cartilaginous, hypostomatous. RACEMES with the sessile flowers grouped in a trilocular cupula, perigone hexamerous; pistillode present in the male flowers.

**Geographic distribution:** Brasil: MG, RJ, SP.
**Selected examined material:** RIO DE JANEIRO: **Itatiaia,** Parque Nacional do Itatiaia, próximo ao centro de visitantes, 22°15'S_44°34'W, em Euphorbiaceae, 5 dez. 1997, bt., *J.M.A.Braga et al. 4525* (RB). **Nova Friburgo,** Lumiar, Toca da Onça, sobre Asteraceae, 4 jul. 2003, bt.,

[39] for the similarity of the leaves to *Salix* (Salicaceae).
[40] *staphylinus* = cluster of grapes, grouped fruits.

*C.H.R.dePaula 505* (RUSU). **Petrópolis,** Carangola, sítio do Roberto and da Cristiane, sobre *Luehea* sp., 7 ago. 2002, fl., *C.H.R.dePaula et al. 387* (RUSU). **Rio Claro,** Lídice, 630 ms.m., 28 dez. 2001, fl., *F.M.B.Pereira 34/137* (RFA). **Teresópolis,** Vargem Grande, Sítio do Professor, sobre *Tibouchina* sp., 5 jul. 2003, fl., *C.H.R.dePaula 493* (RUSU).
**Comments:** Very common species in the Serranias of the State, where it is sufficiently generalistic in relation to its hosts. The leaves with auriculate bases are extremely characteristic of this species, also occurring in *S. dorothyi* that besides possessing leaves of distinct form, it is until now only recorded for Restinga of Cabiúnas.

**5.14.1.** ***Struthanthus staphylinus* var. *palifolius***[41] Rizz., Rev. Bras. Biol. 10(4): 407. 1950.
**Type:** Brasil, Itatiaia, Itaoca, *P.Occhioni 1122* (holotype RB).
Figure: 29

It differs from the typical variety by its oblong, rarely oblong-lanceolate leaves.

**Geographic distribution:** Brasil: RJ.
**Comments:** In the original work, the author of the variety (Rizzini 1950b) describes only the form of the leaf, commenting on nothing concerning the plant as a whole nor supplying an illustration. However, Rizzini (1956) presents a drawing of the plant, which suggests that only the lateral branches have leaves in the form as described above. Because the type was not located, it is not possible to know the real amplitude of occurrence of oblong leaves in the plant, and it is then not possible to make a new determination.

**5.15.** ***Struthanthus syringifolius***[42] Mart., Flora 13(1): 105. 1830.
*Loranthus syringifolius* Mart. *in* Schultes & Schultes, Syst. Veg. 7:141-142. 1829. **Type:** Brasil, Amazonas: Rio Negro, entre Manaqueri and Manaus, *Martius* s.n. (lectotype M, foto Field Mus.19042, designated by Kuijt 1994)
Figure: 28, 29 and 30

PLANTS erect, half-pendulous. STEMS strongly quadrangular, branches cylindrical. Young LEAVES not hamato-bending, ovate, apex acute, acuminate, base attenuated, petiole remarkably long, margin cartilaginous, amphistomatous. RACEMES with the sessile flowers, grouped in triads on a trilocular cupula, where the medium bract is much larger that the laterals, perigone hexamerous; pistillode present in the male flowers.

**Geographic distribution:** Brasil: AM, CE, PB, BA, MG, RJ; Venezuela.
**Selected examined material:** RIO DE JANEIRO: **Barra do Piraí,** ilha dos amores do Itapoã, em *Inga affinis*, 7 nov. 1984, fl., fr., *J.P.P.Carauta et al.* 4977 (GUA). **Itatiaia,** s.loc., s.d., *Brade 18807* (RB). **Rio de Janeiro:** estrada Rio-Petrópolis, sobre *Inga* sp., 7 ago. 2002, fr., *C.H.R.dePaula, P.Leitman and C.T.Barata 386* (RUSU). **Teresópolis:** Parque Nacional da Serra dos Órgãos, ao lado do herbarium, sobre *Cupania* sp., 14 dez. 2003, bt., *C.H.R.dePaula et. al. 516* (HPN, R, RUSU).
**Comments:** The medium bract, much larger than the laterals, and petioles, unique amongst the

[41] *palus* = pole, stake; in allusion to the narrow leaves
[42] for leaves similar to *Syringa* (Oleaceae).

species of the State of Rio de Janeiro, characterizes the species. The individual from the material of C.H.R.dePaula et al. 516 were one of the largest observed in the genus, with DAP of ca. of 5 cm, with the extremely odoriferous flowers.

**5.16. *Struthanthus uraguensis*[43] var. *uraguensis*** (Hook. *et* Arn.)G.Don, Gen. Syst., 3: 410.1834.
*Loranthus uraguensis* Hooker F. *et* Arnott, Hook. Bot. Misc., 3: 358.1833. **Type:** Brasil, s.loc., s.d., *Sellow 994* (holotype B).
*Struthanthus complexus* Eichl. *in* Mart., Fl. bras. 5(2): 73, pr. 21. 1868.
Figure: 27, 32 and 35

PLANTS of complex habit. STEMS quadrangular, branches cylindrical. Young LEAVES not hamato-bending, adult, strait-lanceolate, apex sharp-acuminate, base cuneate, margin non-cartilaginous, amphistomatous. UMBELS 2-radiate with the sessile flowers, grouped in triads on a trilocular cupula, perigone hexamerous; pistillode absent in the male flowers.

**Geographic distribution:** Brasil: MG, SP, RJ, PR, SC, RS; Uruguay, Paraguay.
**Selected examined material:** RIO DE JANEIRO: **Itatiaia,** Brejo da Lapa, 22°15'S_44°34'W, 26 nov. 2002, bt., *S.J.S.Neto et al. 1741* (RB). **Teresópolis,** Pedra do Chapadão, 5 nov. 1952, bt., *C.T.Rizzini 1161* (RB).
**Additional selected material:** PARANÁ: **Curitiba,** Vale do Barigui, 24 set. 1948, fl., *G.Tessmann* s.n. (RB 66319), *ibidem,* Bariguy, sobre *Schinus therebinthifolius*, 30 jun. 1958, *B.Lange 1129* (RB). SANTA CATARINA: **Nova Teutônia,** s.loc., 12 jun. 1944, fl., *F.Plaumann 570* (RB), **Catanduvas,** 12 out. 1964, fl., *L.B.Smith and R.Reitz 12449* (RB).
**Comments:** Despite the inflorescences of this species being characterized as umbels, some racemes can be found in the same individuals. According to Sugyiama (1992) this species is frequently found on *Laguncularia racemosa* (L.) Gaertn. (Combretaceae).

**5.16.1. *Struthanthus uraguensis* var. *stylandrus*[44]** Rizz., Revta. Bras. Biol. 51(2):458. 1991.
**Type:** Brasil, Rio de Janeiro, município de Itatiaia, Macieiras, 7 mar. 1947, fl., *P.Occhionni 860* (holotype RB!).
Figure: 32

It differs from the typical variety only for having a style (pistillode) in the male flowers.

**Geographic distribution:** Brasil: RJ.
**Comments:** For this variety only the type material is known that up to now was found mixed in the general herbarium collections.

**5.17. *Struthanthus vulgaris*[45]** Mart. *ex* Eichl. *in* Mart., Fl. bras. 5(2): 70, 85, pr.27 e pr. 28, fig. 8. 1868. **Tipo:** Brasil, São Paulo, *Burchell 5159* (lectótipo BR, designado por Kuijt 1994).
Figures: 27, 31, 32 and 35

[43] of Uruguay.
[44] for having a pistillode in the male flower.
[45] *vulgaris*=common, therefore it is easily found in various places.

PLANTS erect, semi-pendulous. STEMS and branches cylindrical. Young LEAVES not hamato-bending, adult ovate or elliptical, base round, apex acuminate, margin non-cartilaginous, amphistomatous. UMBELS 2-radiate with the pedunculate flowers, grouped in triads or diads, trilocular cupula absent, perigone hexamerous; pistillode present in the male flowers.

**Geographic distribution:** Brasil: MG, SP, RJ, PR, SC.
**Selected examined material:** RIO DE JANEIRO: **Caxias,** Reserva da Petrobrás, 22°33'S_43°15'W, próximo ao alojamento, sobre *Psidium guayava*, 30 mar. 1999, fl., *C.H.R.dePaula et al. 160* (RB). **Macaé,** próximo ao córrego da Capivara, 24 ago. 1982, fr., *D.S.D.Araújo 5170* (GUA). **Paraty**, trilha de Parati-mirim para o saco do Mamanguá, sobre Leguminosae, 22 jan. 2001, fl., *A.Lobão and P.Fiaschy 537* (RUSU). **Rio de Janeiro**, Horto, estrada Dona Castorina, sobre goiabeira, 12 abr. 1999, fl., *C.H.R.dePaula and S.J.S.Neto 132* (RUSU); *ibidem*, estrada Vista Chinesa, sobre *Chorisia crispiflora*, 12 mar. 2002, fl., *M.C.Vianna* s.n. (GUA 47481); *ibidem*, campus da Universidade Santa Úrsula, sobre goiabeira, 3 fev. 2003, fl., *C.H.R.dePaula 530* (RUSU). **Mangaratiba**, Reserva Rio das Pedras, trilha à direita do poço do rio Grande, sobre Goiabeira, 13 jun. 2000, fl., *C.H.R.dePaula et al. 246* (RUSU).
**Comments:** Plant mostly common, being frequently observed on goiabeiras (Psidium guayava - Myrtaceae). One of the few shade-loving species amongst those that occur in Rio de Janeiro, growing in the interior of the crown of the hosts. The epicortical roots eventually cover stem and branches of the host, producing sprouts. It can produce ample leaves that are among the largest observed for the genus in the State of Rio de Janeiro.

**6. *TRIPODANTHUS*[46]** (Eichl.) Tiegh., Bull. Soc. Bot. France 42:178. 1895.
**Type:** *Phrygilanthus* (Eichl. *in* Mart. Fl. bras. 5(2): 45-46.1868.) subgen. *Tripodanthus* Eichl. *in* Mart., Fl. bras. 5(2): 48. 1868.

Epiphytic SHRUBS parasitic on branches or lianas and/or tree-like parasites of roots, monoecious. Cylindrical BRANCHES always densely lenticelate. LEAVES petiolate, opposite or alternate, lanceolate, or linear, apex acute or acuminate, base acute, cuneate, attenuated or decurrent. INFLORESCENCES terminal or axillary in racemes or corymbs. Buds clavate. FLOWERS small, ca. of 1.5-2.0 cm in diam., pedicellate, grouped in triads, hexamerous, monochlamydous, fleshy tepals, reflexed at anthesis, white or greenish-white, yellowish or red. Stamens epitepalous, dimorphic, anthers dorsifixed, versatile, pollen grains trilobed with granular exine, tricolpate; nectary disk lobed, central style filiform, stigma capitate or bilobed. FRUITS baccoid, black, seed with endosperm, embryo 2-cotyledonous.

*Tripodanthus* (Eichl.)Tiegh. was split from *Phrygilanthus* Eichl. (= *Notanthera* G. Don) by Barlow (1973), who included within it only two species: *T. flagellaris* that occurs only in the north-central region of Argentina and adjacent Brazil and Uruguay and, *T. acutifolius* of broader distribution, and only in the State of Rio de Janeiro.

[46] from three (*tri*) flowers (*anthus*) with feet (*podos*), i.e., pedunculate.

**6.1. *Tripodanthus acutifolius*[47]** (Ruiz *et* Pav.) Tiegh., Bull. Soc. Bot. France 42: 179, fig. 12. 1895.
*Loranthus acutifolius* Ruiz *et* Pav., Fl. Peruv. 3: 48, fig. 274b. 1802. **Type:** Peru, s.loc., *H.Ruiz and J.Pavon* s.n. (holotype MO)
*Loranthus eugenioides* H.B.K., Nov. Gen. *et* Sp. 3: 435. 1818.
*Loranthus odoriferus* Vell., Fl. Flumin. Ic. 3, tab. 146. 1831(1829), Arq. Mus. Nac. R. Jan. 5: 130. 1881.
*Phrygilanthus eugenioides* (H.B.K.)Eichl. *in* Mart., Fl. bras. 5(2): 50.1868.
*Phrygilanthus acutifolius* (Ruiz *et* Pavon) Eichl. *in* Mart., Fl. bras. 5(2): 49.1868.
*Phrygilanthus ligustrinus* (Willd.)Eichl. *in* Mart., Fl. bras. 5(2): 50.1868.
Figures: 32, 33, 34 and 35
TREES, lianas or EPIPHYTES. LEAVES opposite, oval-lanceolate to lanceolate, with acuminate apex and cuneate base; some individuals have black punctuations in the abaxial face. RACEMES axillary, solitary. FLOWERS with white tepals. FRUITS elipsoidal, black.

TREES, lianas or EPIPHYTES. LEAVES opposite, oval-lanceolate to lanceolate, with acuminate apex and cuneate base; some individuals have black punctuations in the abaxial face. RACEMES axillary, solitary. FLOWERS with white tepals. FRUITS elipsoidal, black.

**Geographic distribution:** Brasil: CE, BA, GO, MG, RJ, SP, PR, SC, RS; Argentina, Uruguay, Paraguay, Peru, Bolivia, Venezuela, Equador.
**Selected examined material:** RIO DE JANEIRO: Petrópolis, alto do Morim, terreno de pedras, s.d., fl., *J.Saldanha and Glaziou* s.n. (R 57402).
**Additional selected material:** BAHIA: **Morro do Chapéu,** s.loc., 11°29'23''S_41°12'50''W, 20 out. 1980, fl., fr., *R.P.Orlandi 306* (RB). GOIÁS: **Corumbá de Goiás,** na estrada para Niquelândia, 1150 msm, 13 jan. 1968, fr., *H.S.Irwin et al. 18543* (IAN, RB). MINAS GERAIS: **São João D'El Rey**, Serra de São José, parasito de Anacardiaceae, 15 nov. 2002, fl., *C.H.R.dePaula and R.Bacelar 431* (R, RUSU). RIO GRANDE DO SUL: **Vacaria**, 219 km ao norte de Porto Alegre, sobre *Lithraea* sp., 28 dez. 1966, fl, *J.C.Lindeman and J.H.deHaas 3720* (RB).
**Comments:** The"most astute" plant (Hoehne 1831) for presenting itself as an epiphytic plant, as a liana or even as a tree. In the two last forms, the connection to the host is made to the roots under the soil and, thus, at the same time, parasitizing diverse arboreal species of diverse forms; such condition is only amongst the Brazilian Loranthaceae and also observed in *Gaiadendron punctatum* of Costa Rica and *Nuytsia floribunda* of Australia, that is always a tree.

The occurrence of this species in the State of Rio de Janeiro is widely documented in the literature, having a print and a respective description in Velloso (1831). The citation by Eichler (1868), however , does not indicate the analyzed material. Rizzini (1954) and later Fogaça (1996) in his list of taxa cite *Phrygilanthus* sp., however, the material on which it was based was not found in the RB herbarium. Inversely, only one herbarium specimen was found, the one listed above, that consists of only a unicate without indication of duplicates in other herbaria.

It is a very common plant in the southern region of the country where it can also be observed on urban trees, under the three cited forms (epiphyte, liana and tree). It is distinguished as the

[47] leaves with an acute apex.

most odoriferous amongst those observed *in vivum* in this study, as it is possible to perceive its odor at metric distances, so notable that Velloso (1831) used this characteristic to baptize this species in the *Flora Fluminensis*.

Some aboriginal groups in Peru use leaves of this species to substitute for the leaves of "chacrona" (*Psychotria viridis* - Rubiaceae) in the preparation of the "Ayahuasca" (Schultes & Raffauf 1999).

**III. VISCACEAE** Miers, Ann. & Mag. Nat. Hist., ser. 2, 8: 178. 1851.
**Type genus:** *Viscum*[48] L., Sp. Pl. 2:1023. 1753.

Epiphytic SHRUBS, glabrous or pilose, parasites of branches of dicotyledons and gymnosperms, always attached to the host by only a primary haustorium, this becoming enlarged internally (endophyte) and generally emitting sprouts along the length of the host branches, monoecious or dioecious. STEMS and branches flattened, angular or cylindrical, erect, semi-pendulous or pendulous; some genera possess cataphylls adnate in a sheath at the base and at times, along (intercalated) all the nodes or only on the basal nodes. LEAVES developed, rarely reduced to scales or absent, opposite, petiolate or sessile. INFLORESCENCES in spikes or FLOWERS, at times inserted in a diminutive cavity of the inflorescences axis (foveate), melitophilous [bee-pollinated] or canterophilous [beetle-pollinated], in monoecious or dioecious plants, without calyculus. Perigone 2-4-merous with simple, green, yellowish-green segments or more rarely ocher, dehiscence valvate. Stamens in equal number to the perigone segments, adnate to the tepals, filaments very short, anthers monothecal or dithecal, dehiscent poricidal or septation longitudinal or transverse; pollen spherical. Discrete nectary disk, style short, stigma little differentiated. FRUITS baccoid, elliptical or globose. The seed is composed of chlorophyllous endosperm and a central, linear-oblong embryo, always 2-cotyledonous; ornithochorous [bird-dispersed] or ballistic dispersal (*Arceuthobium* spp.).

The first proposal of Viscaceae as an independent family was made by Miers (1851) who thus grouped the genera *Viscum*, *Mizodendron* and *Lepidoceras*, but on the same occasion, considers that such a group could constitute a sub-family of Santalaceae but did not supply an appropriate description of the family. Some years later, Miquel (1856) agreed with the opinion of Miers (1851) and published one formal diagnosis of the family, attributing the authorship to this author.

Hyperparasitism is common in the family, particularly *Phoradendron dipterum*, which many times is found on other species of the same generus.

Specificity in the host-parasite relationship was not observed, having, however, some cases where a certain "affinity" was evidenced, as for example *Dendrophthora elliptica* which is found many times on *Tibouchina* sp. (Melastomataceae); *Phoradendron fragile* on *Alchornea* sp. (Euphorbiaceae); *Phoradendron piperoides* on *Guarea guidonia* (L.)Sleum. (Meliaceae) and *Phoradendron quadrangulare* on Bignoniaceae (*Tabebuia* spp., *Sparattosperma* spp.).

The species most commonly seen in Restingas are *Phoradendron obtusissimum*, *P. piperoides*, *P. crassifolium* and *P. bathyoryctum* and *P. piperoides*, *P. quadrangulare* and *P. undulatum* in the Matas.

Viscaceae includes about seven genera and 350 species, *Phoradendron* being the largest genus with about 220 species in Americas, *Viscum*, with 60 species in Africa and Europe and

[48] *Viscum* = viscous (from the seeds).

*Dendrophthora* with 60 species in Central America and to the south in Brazil occur two genera *Dendrophthora* and *Phoradendron*, that together form the Phoradendreae tribe, with about 80 species. They had been recorded in the State of Rio de Janeiro, the occurrence of these two genera with two and 16 species, respectively.

**Key to the genera of Viscaceae in the State of Rio de Janeiro**

1- Anthers unilocular, septation transverse ..... **1. *Dendrophthora***
1'- Anthers bilocular, septation longitudinal ..... **2. *Phoradendron***

**1. *Dendrophthora*[49]** Eichl. in Mart., Fl. bras.5(2):102, pr.31, série 2, figs. 1-5.1868.
**Type species:** *Dendrophthora opuntioides* (L.)Eichl. *in* Mart., Fl. bras 5(2): 102. 1868.

SHRUBS glabrous or pilose, dioecious or monoecious. STEMS cylindrical, quadrangular, flattened or ancipital [both edges sharp], that is, widened at the apex of the nodes, forming two lateral keels, erect branches or half-pendulous, when very long, cylindrical, quadrangular or flattened. One to many SHEATHING CATAPHYLLS formed by the fusion of two opposite cataphylls, of basal disposition when they are only at the base of each ramification or percurrent, when they are present also at the nodes of the long one of the branches. Phyllotaxy of cataphylls of two types: medium, when the apices are parallel to the leaves and the branches of which if they had originated, or transverse, when the apices are crossed in relation to the leaves and branches. LEAVES absent, reduced to scales or normal, developed, opposite decussate, petiolate, short-petiolate or sessile, ovate, oval, elliptical, circular, linear, blades falciform, apex acute, round, emarginate, at times acuminate, also base acute, round or decurrent. Nervation pinnate or palmate, conspicuous or inconspicuous. SPIKES axillary, composed of diverse articulations that emerge one inside the other, each articulation with two bracts similar to the cataphylls of the branches; of one to many basal, sterile ones and of one to many floriferous ones above of the basal. FLOWERS unisexual in the same spike, in different spikes, inserted in the fovea (sockets) of the spikes, arranged in one, two, three or many longitudinal series above each bract, or either, 1 x 2, 2 x 2, etc. - seried, always with an uneven apical flower. Flowers small, the male composed of three fleshy tepals of valvate aestivation. Stamens sessile, anthers unilocular, dehiscent via transverse septum, pistillode rudimentary. Female flowers similar to the male, with a central sessile stigma, enveloped by a fleshy, little perceptible disk, ovary inferior with undifferentiateds ovules; staminodes absent. FRUITS baccoid, crowned by the persistent perigone that can be open or closed in the mature fruit, pericarp smooth or tuberculate, of various colors, white, yellowish, pink and orange. A seed enveloped in great amount of viscin, white or generally orange; endosperm chlorophyllous, embryo 2-cotyledonous.

A neotropical genus of about 120 distributed species from southern Mexico, including Cuba and the Caribbean, South America to Bolivia and the southeast Brazil, having clear preference for the great altitudes. In Brazil occurs only about eight species. In Rio de Janeiro they had been evidenced the occurrence of *D. elliptica* and *D. warmingii*, both inhabiting the regions above of 1,000 meters in altitude to the length of the Serra do Mar.

[49] one that ruins (*phtherein*) a tree (*dendron*).

**Key to the species**

1. Small plants; leaves with smooth surface in dry material; spikes with only 1 floral articulation ..... **1. *D. elliptica***

Small plants; leaves with smooth surface in dry material; spikes with only 1 floral articulation

1'. Large plants; leaves with rugose surface in dry material; spikes with 2(3) floral articulations .....**2. *D. warmingii***

**1.1. *Dendrophthora elliptica*[50] var. *elliptica***(Gardn.) Kr. *et* Urb., Ber. Deutsch. Bot. Gesel.14(8):285. figs. 40, 41. 1896.

*Viscum ellipticum* Gardn. *in* Hook., Lond. Journ. Bot. 4: 106. 1845. **Type:** Brasil, Rio de Janeiro, em lugares pedregosos na Serra dos Órgãos, sobre *Gaylussacia* sp. (Ericaceae) *Gardner 437* (holotype K, isotypes G, IT).

*Phoradendron ellipticum* (Gardn.) Eichl. *in* Mart., Fl.bras. 5 (2): 119, pr. 37, fig. 2. 1868.

*Phoradendron pearcei* Rusby, Bull. Tor. Bot. Club 27: 136. 1900

*Dendrophthora rubicunda* Ule, Notizbl Bot. Gart. Berlin 6: 289. 1915.

*Phoradendron dendrophthora* Rizz., Rev. Fac. Agron.Maracay, 8(3): 87. 1975.

*Dendrophthora hylaeana* Rizz., Rodrig. 41: 8. 1976.

Figures: 36, 37, 38 and 39

SHRUBS monoecious, small, green, green-yellowish *in vivo*, cloudy green when dry; STEMS ancipital, erect, branches cylindrical; a case to cataphyll at the base of each ramification, intercalated cataphylls absent. LEAVES short-petiolate, elliptical, apex and base obtuse, round, trinerved, weakly perceptable ribbings, smooth surface in dry material. SPIKES, one per foliar axil, composed of 1 articulated basal sterile and 1 articulated floral with 3-5 flowers, 2x3 seried; FRUITS with an open perigone.

**Geographic distribution:** Brasil: AM, GO, MG, ES RJ, SP; Venezuela, Equador.

**Selected examined material:** RIO DE JANEIRO: **Teresópolis,** trilha para o Abrigo 2, sobre *Tibouchina* sp., flores verdes and frutos brancos adocicados, 3 out. 2002, fl., fr., *C.H.R.dePaula et al. 509* (RUSU, R), Pico da Bandeira, sobre *Tibouchina* sp., 5 nov 1952, fl., fr., *C.T.Rizzini 1162* (RB). **Santa Maria Madalena,** Parque Estadual do Desengano, Pedra do Desengano, vertente NW, 1700-1800 ms.m., 20 dez 1988, fr., *G.Martinelli et al. 13227* (RB).

**Additional selected material:** AMAZÔNIA: **Rio Auaris,** sobre Ericaceae, 6 dez. 1973, fr. *G.T.Prance et al. 20051* (RB). BAHIA: **Lençóis,** Serra Larga, 1400 ms.m., sobre *Miconia* sp., 19 dez. 1984, fr., *B.Stannard et al.* s.n. (RB 314065). ESPÍRITO SANTO: **Castelo,** Forno Grande, em Myrtaceae, 12 ago. 1948, fl., *A.C.Brade 192476* (RB). GOIÁS: **Alto Paraíso,** Chapada dos Veadeiros, sobre *Conomorpha* sp., 1250 ms.m, 21 mar. 1971, fl., *H.S.Irwin et al. 32880* (RB). MINAS GERAIS: **Ibitipoca,** em *Rapanea* sp., 13 maio 1970, fr., *D.Sucre and P.L.Krieger 6759* (RB). VENEZUELA: **Bolivar,** Roscio, Gran Sabana, 1200 ms.m, sobre *Miconia* sp., 3 dez. 1982, fl., *J.A.Steyermark and R.Liesner 127629* (RB).

**Comments:** Material collected by CHRdePaula et al. 509 was not observed, spikes being born in the cataphyllous axils, contrary to what it says in the literature that only mentions them occurring in the foliar axils. In the State of Rio de Janeiro found in the Serra dos Órgãos and in Santa Maria Madalena, inhabiting altitudes of 1,000 ms.m., parasitizing Melastomataceae,

[50] from the elliptical leaves.

Myrsinaceae and Ericaceae. Female blossoms constantly produce a considerable amount of fruits, these can fall on the branches of the mother plant where the seeds germinate.

**1.2. *Dendrophthora warmingii*[51]** (Eichler) Kuijt, Novon 13: 72-88. 2003.
*Phoradendron warmingii* Eichl., Vidensk. Meddel. Naturhist. Foren. Kjoeb.: 209. 1870. **Type:** Brasil, Minas Gerais, Lagoa Santa, 14 jan. 1865, *Warming 383* (holotype C).
*Phoradendron simile* Rizz., Rodriguésia 28/29: 191. 1956.
*Phoradendron tepuianum* Steyermark, Fieldiana 28 (1): 222. 1957.
*Phoradendron triplinervium* Rizz., Revta. Fac. Agron. (Maracay) 8(3): 90. 1975.
*Phoradendron orbiculare* Rizz., Revta. Fac. Agron. (Maracay) 8(3): 90. 1975.
*Phoradendron virens* Rizz., Ernstia 32: 3. 1985.
*Dendrophthora tepuiana* (Steyer.)Kuijt, Proc. Kon. Ned. Akad. Wetensch. 93: 138. 1990.
Figures: 38 and 39

SHRUBS Monoecious, robust, coloration medium brown in vivo, blackish when dry. STEMS slightly ancipital, branches cylindrical; a sheathing cataphyll at the base of each ramification, intercallary cataphylls absent. LEAVES with distinct petioles, elliptical, ovate or obovate, apex acute and base obtuse, 3-5-(7 -) nerved, conspicuous ribbings, rugose surface in dry material. SPIKES, one per foliar axil, composed of 1 articulated basal sterile and 2-3 articulated floral with 5-7 flowers, 2x2 seried. FRUITS with an open perigone.

**Geographic distribution:** Brasil: MG, RJ; Venezuela.
**Selected examined material:** RIO DE JANEIRO: **Teresópolis,** Parque Nacional da Serra dos Órgãos, trilha para Pedra do Sino, 3 jun. 1999, bt., *C.H.R.dePaula and A.Lobão, 173* (RUSU).
**Comments:** The medium brown coloration of the live plant is distinguishable in the canopy. One or another leaf can be developed asymmetrically, acquiring a falciform aspect. In a general way it is much more robust in that *D. elliptica*.

**2. *Phoradendron*[52]** Nutt., Journ. Acad. Nat. Sci. Philadelphia, ser. 2(1): 185. 1848
**Type species:** *Phoradendron californicum* Nutt., Journ. Acad. Philadelphia, ser. 2 (1): 185. 1848.
*Allobium* Miers., Ann. Mag. Nat. Hist. 8: 178. 1851.
*Spiciviscum* Karsten, Flora Columb. 1(2): 73. 1859.

SHRUBS glabrous or pilose, dioecious or monoecious. STEMS cylindrical, quadrangular, flattened or ancipital, that is, widened at the apex of the nodes, forming two lateral keels, branches erect, pendulous, or semi-pendulous when very long, cylindrical, quadrangular or flattened, nodes articulated. One to many SHEATHING CATAPHYLLS formed by the fusion of two opposite cataphylls, of basal disposal when they are only between the base of each ramification or percurrent, when they are present also at the nodes of the long branches. Phyllotaxy of the cataphylls of two types: medial or transverse. LEAVES absent, reduced to scales or normally developed, opposite decussate, petiolate, short-petiolate or sessile, blades ovate, oval, elliptical, circular, linear, falciform, apex acute, round, emarginate, at times

[51] in honor of the collector of the holotype.
[52] whose support (*phora*) is a tree (*dendron*).

acuminate, also base acute, round or decurrent. Nervation pinnate or palmate, conspicuous or inconspicuous. SPIKES axillary, composed of diverse articulations that emerge one inside the other, each articulation with two bracts similar to the cataphylls of the branches; of one to many basal, sterile ones and of one to many floral ones above the basal. FLOWERS unisexual in the same spike, in different spikes, inserted in the fovea (sockets) of the spikes, arranged in one, two, three or many longitudinal series above each bract, or either, 1 x 2, 2 x 2, etc. – seried, always with an uneven apical flower. Male flowers composed of three fleshy tepals with valvate aestivation. Stamens sessile, anthers bilocular, dehiscent by longitudinal septation; pistillode rudimentary. Female flowers similar to the male, with a central sessile stigma, enveloped by a fleshy, little perceptable disk, ovary inferior with undifferentiated ovules; staminodes absent. FRUITS baccoid, crowned by the persistent perigone that can be open or closed in the mature fruit, pericarp smooth or tuberculate, of various colors, white, yellowish, pink and orange. Seed one, enveloped by great amount of white or generally orange viscin; endosperm chlorophyllous, embryo 2-cotyledonous.

*Phoradendron* is extremely similar to *Dendrophthora*, the only difference being the anthers, a difficult character given the diminutive size of the flowers and, one that it cannot be seen in young plants or with fruits. Some other differences would be the preference of *Dendrophthora* for great altitudes, where few *Phoradendron* occur; a larger number of aphyllous or microphyllous plants; *Phoradendron* contains more robust plants, cases of cataphylls being more frequent, mainly in the lateral branches, the spikes are larger with flowers more frequently 2-multi-seried and according to Rizzini (1982) about 2/3 of the species have 1x2 seried flowers. Currently, *Phoradendron* has almost double the number of species as *Dendrophthora*, 234 versus 120, respectively.

For Brazil the estimated ca. 62 species spread through all the domestic territory, however, they are especially abundant in the open pasture. In the State of Rio de Janeiro 16 species have been found.

**Key to the species**

1. Plants without leaves
2. Stems cylindrical, erect ..... **7. *P. fragile***
2'. Stems flattened, pendulous ..... **15. *P. tunaeforme***
1'. Plants with leaves
3. Sheathing intercallary cataphylls present
4. Sheathing intercallaries from 2 to 5, fertile. ..... **4. *P. crassifolium***
4'. Sheathing intercallaries 1, not fertile ..... **11. *P. piperoides***
3'. Sheathing intercallary cataphylls absent
5. Stems quadrangular
6. Spikes 3x2 seried; fruits white to yellowish colored ..... **5. *P. dipterum***
6'. Spikes 2x2 seried; fruits orange ..... **13. *P. quadrangulare***
5'. Stems cylindrical
7. Foliar nerves pinnate
8. Leaves obovate ..... **12. *P. pteroneuron***
8'. Leaves lanceolate ..... **16. *P. undulatum***
7'. Foliar nerves palmate
9. Fruiting perigone open
10. Spikes with 1 sterile basal articulation ..... **14. *P. strongylocladus***

10’. Spikes with 2 sterile basal articulations .....**10. *P. obtussisimum***
9’. Fruiting perigone closed
11. Leaves linear..... **8. *P. linearifolium***
11’. Leaves of other forms
12. Leaves falciform; sheathing basal cataphylls generally 2, rarely 1 or 4
..... **6. *P. falcifrons***
12’. Leaves eliptical, ovate, lanceolate; 1 sheathing basal cataphylls
13. Flowers deeply immersed in the rachis. .....**2. *P. bathyoryctum***
13’. Flowers not deeply immersed in the rachis
14. Floral articulation 3x2 seried ..... **3. *P. chrysocladon***
14’. Floral articulation 2x2 seried
15. Leaves obovate or elliptical .....**1. *P. affine***
15’. Leaves lanceolate ..... **9. *P. nigricans***

**2.1. *Phoradendron affine*[53] (Pohl *ex* DC.)Engl. *et* Krause**, Nat. Pflanzenfam. 16:191. 1935.
*Viscum affine* Pohl *ex* DC., Prodr. 4:281. 1830. **Type:** Brasil, Minas Gerais, São João Batista, *Pohl 544* (holotype G, isotype W, destruído)
*Phoradendron wiesnerianum* Trel., Phoradendron 109, fig. 156. 1916.
*Phoradendron cuspidatum* Rizz., Rodriguésia 30/31: 182. 1956.
*Phoradendron lineolatum* Rizz., Rodriguésia 30/31: 184. 1956.
Figures: 40 and 41

PLANTS delicate, green-dark. STEMS slightly quadrangular, branches cylindrical; sheathing cataphylls on basal internode, intercallary sheathing cataphylls absent. LEAVES ca. 6.0, x 2.0 cm, obovate or elliptical, apex narrowly rounded, attenuated, 3-nerved at the base, nerves conspicuous. INFLORESCÊNCIA 1 sterile basal articulation and 3-4 floriferous with 3-9 seried flowers 2x2. FRUITS orange, closed perigone.

**Geographic distribution:** Brasil: AM, PA, MA, PI, RN, AL, PB, PE, BA, MT, MS, GO, DF, ES, MG, RJ, SP, SC; Paraguay, Argentina.
**Selected examined material:** RIO DE JANEIRO: **São João da Barra,** s.loc. s.d., *Peixoto et al. 826* (RB). **Rio de Janeiro,** praia de Sepetiba, sobre *Gallesia gorazema*, s.d., *Machado 2004* (RB).
**Additional selected material:** BAHIA: **Reserva Ecológica Raso da Catarina,** sobre “catinga-de-porco”, 5 mar. 1981, fr., *L.Paganucci and M.L.Guedes* s.n. (RB 260388). GOIÁS: **Goiás Velho,** s.loc., 800 ms.m., sobre Myrtaceae, 18 jan. 1966, fl., *H.S.Irwin et al. 11708* (RB). MATO GROSSO: **Xanvantina,** Rio Turvo, 500 ms.m., em Compositae, 29 maio 1966, *H.S.Irwin et al. 16242a* (RB). PIAUÍ: **Cocal,** s.loc., 110 ms.m., 21 jun. 1972, fl., *D.Sucre and J.F.Silva 9243* (RB).
**Comments:** *P. affine* and *P. quadrangulare* are extremely similar species in all the essential characters. Kuijt (2003b) based his separation on both the degree of angularity of the branches and the form of the leaves. In the examined material it was noticed that such characteristics are difficult to delimit, fitting for the future a deepened study of the involved taxa.

[53] appearing similar (as another species).

**2.2. *Phoradendron bathyoryctum*[54] Eichl.** *in* Mart., Fl. bras. 5(2): 123, pr.43, fig. 2. 1868. **Type:** Brasil, Piauí, *Gardner 2626* (lectotype P isolectotypes BM, ILL, K, US, designated by Kuijt 1994).
*Phoradendron ulophyllum* Eichl. *in* Mart., Fl. bras. 5(2): 123. 1868.
*Phoradendron alophyllum* Eichl. *ex* Glaz., Bull. Soc. Bot. France, Mém. 3g: 609. 1913.
*Phoradendron hieronymi* Trel., Phoradendron: 123, fig. 180. 1916.
*Phoradendron balansae* Trel., Phoradendron: 132. 1916.
*Phoradendron balansae* f. *hassleri* Trel., Phoradendron: 132. 1916.
*Phoradendron balansae* f. *morongii* Trel., Phoradendron: 132. 1916.
*Phoradendron psittacanthobium* Rizz., Rodriguésia 30/31: 186. 1956.
*Phoradendron pinheirense* Rizz., Arq. Jard. Bot. Rio de Janeiro 24: 35. 1980.
Figures: 40, 41 and 43

PLANTS robust. STEMS slightly flattened or angular, branches green or brownish; sheathing cataphylls at the base of first internode of each ramification. LEAVES ca. 7.0 x 15.0 cm, elliptical, ovate, apex round, base acute, decurrent; nerves 5-7 palmate. INFLORESCENCES with 1-2 sterile basal articulations and (3) 4 (-5) floriferous articulations with 13 seried flowers 2x2, fovea deep. FRUITS globose, yellowish-white, perigone closed.

**Geographic distribution:** Brasil: MA, CE, PE, BA, GO, DF, MT, MS, ES, RJ, SP, PR, SC, RS; Suriname, Venezuela, Bolivia, Paraguay and Argentina.
**Selected examined material:** RIO DE JANEIRO: **Maricá,** restinga de Maricá, 22°57'681''S_42°52'811''W, sobre *Clusia* sp., 22 jun. 2003, fl., fr., *C.H.R.dePaula 491* (RUSU).
**Additional selected material:** BAHIA: **Maracás,** s.loc., 15 mar. 1980, fl., fr., *G.Martinelli and A.M.Carvalho 6642* (RB). DISTRITO FEDERAL: **Brasília,** entre Brasília and Niquelândia, 10 maio 1963, fr., *J.M.Pires et al. 9746* (RB). GOIÁS: **Paraíso,** s.loc., 600 ms.m., em Anacardiaceae, 24 mar. 1968, fl., fr., *H.S.Irwin et al. 21742* (RB). MINAS GERAIS: **Bocaiúva,** s.loc., em *Machaerium* sp., 20 nov. 1997, fr., *G.Hatschbach et al. 67301* (RB). VENEZUELA: **Quebrada,** s.loc., 1350 ms.m., 11 fev. 1975, fl., *S.S.Tillet et al 752-219* (RB).
**Comments:** Very common plant in Restingas. It is characterized by being an extremely robust plant and possessing the deepest fovea amongst the studied species.

**2.3. *Phoradendron chrysocladon*[55]** A. Gray, U.S. Explor. Exped. [Bot., Phanerogam.] 15 (1): 743.1854. **Type:** Brasil, Rio de Janeiro, próximo ao Rio de Janeiro, *Wilkes Exped.* s.n. ( holotype US, isotype MO).
*Viscum macrophyllum* McFad., Fl. Jam. 2:195. 1850.
*Phoradendron reticulatum* Urb., Bot. Jahrb. Syst. 23, Beibl. 57: 12. 1897.
*Phoradendron urbanianum* Ule, Verhn. Bot.Vereins. Brandenburg 48: 157. 1906.
*Phoradendron lindavianum* Patsch., Bot. Jahrb. Syst. 45: 438. 1911.
*Phoradendron quinquenervium* Krause, Notzbl. Bot. Gart. Berlim-Dahlen 5: 264. 1912.
*Phoradendron pachyphyllum* Trel., Phoradendron: 151, fig. 228a. 1916.
*Phoradendron knoopii*Warb. *ex* Trel., Phoradendron: 152, fig. 228b. 1916.

[54] *bathys* = deep, *oryctum* = cavity (the spikes).
[55] *chryso* = yellow, golden, *cladus* = stem.

*Phoradendron membranaceum* Trel., Phoradendron: 153. 1916.
*Phoradendron supravenulosum* Trel., Phoradendron: 154, fig. 232. 1916.
*Phoradendron flavens* var. *Australe* Trel., Phoradendron: 155. 1916.
*Phoradendron trisulcatum* Trel., Phoradendron 155, fig. 234a. 1916.
*Phoradendron glyptoneuron* Diels., Bibl. Bot. 29(116): 83. 1937.
*Phoradendron flavens* var. *longispicum* Rizz., Rodriguésia 30:63. 1978.
Figures: 40 and 41

PLANTS yellowish-green, STEMS ancipital, branches cylindrical; sheathing cataphyll at the basal nodes. LEAVES ca. 4.0 x 7.5 cm, ovate, apex acute, base obtuse. INFLORESCENCES with 1 sterile basal articulation and 4 floriferous with 18 flowers, 3x2 seried. FRUITS ovoid, perigone closed.

**Geographic distribution:** Brasil: PB, PE, BA, ES, MG, RJ; Jamaica, Haiti, Mexico, Venezuela, French Guiana, Colombia, Equador, Peru, Bolivia.
**Selected examined material:** RIO DE JANEIRO: **Angra dos Reis,** Ilha Grande, praia do Sul, 2 dez. 1980, fl, fr., *D.S.D.Araújo et al. 4141* (GUA). **Parati,** Morro das Laranjeiras, 87 ms.m, 30 nov. 1993, fr., *E.A.Filho and J.Caruso 104* (RB).
**Additional selected material:** BAHIA: **Estiva,** Serra da Jacobina, 850 ms.m., 40°15'W_10°18'S, 1 mar. 1974, fl., fr., *R.M.Harley et al. 16586* (RB). MINAS GERAIS: **Rio Vermelho,** Pedra Menina, Morro Ambrósio, sobre *Tapirira* sp., 14 jul. 1984, fl., *R.M.Harley et al.* s.n. (RB 288766). PARAÍBA: **Areia,** Escola de Agronomia do Nordeste, 28 out. 1953, fl., *J.C.Moraes* 1005 (RB). EQUADOR: **Azuay,** ca. 1200 ms.m., 7 jun. 1943, fr. *J.A.Steyermark et al. 52889* (RB). VENEZUELA: **Bolivar,** Piar, 5°10'N_62°07'W, 1850 ms.m, 2 fev. 1983, fl., *J.A.Steyermark et al. 128703* (RB).
**Comments:** The species is notable for the cataphylls with extremely acute apices, giving pointed aspect to such structures.

**2.4. *Phoradendron crassifolium*[56]** (Pohl. *ex* DC.) Eichl. *in* Mart., Fl. bras. 5(2): 125, pr. 40. 1868. **Type:** Brasil, Goiás: "Serra d'Ourada", 1839, *Pohl 457* (holotype G).
*Viscum crassifolium* Pohl. *ex* DC., Prodr. 4: 280. 1830.
*Viscum martinicense* DC., Prodr. 4: 280. 1830.
*Phoradendron pepericarpum* A.Gray, U.S.Explor. Exped. [Bot. Phanerogam.]15(1):742. 1854.
*Phoradendron martinicense* (DC.) Griseb., Fl. Brit. W. I. 314. 1864.
*Phoradendron crassifolium* var. *parvifolium* Eichl. *in* Mart., Fl. bras. 5(2): 125. 1868.
*Phoradendron crassifolium* var. *multiflorum* Eichl. *in* Mart., Fl. bras. 5(2): 125. 1868.
*Phoradendron crassifolium* var. *pittieri* Trel., Phoradendron 145, fig. 215.1916
*Phoradendron ayacucheanum* Trel. *in* J.F.Macbr., Field Mus. Nat. Hist., Bot. Ser. 13(2): 385. 1937.
Figures: 41, 42 and 43

PLANTS robust or delicate. STEMS and branches always cylindrical, the 2 5 sheathing cataphylls intercallated with the fertile. LEAVES typically lanceolate, nerves 5-7 conspicuous palmate. INFLORESCENCES with 2-7 sterile basal articulations and 6-9 floriferous with 3-7

[56] from the simple leaves.

flowers 2x2 seried by articulation. FRUITS white, perigone slightly opened.

**Geographic distribution:** Central and South America, with the exception of Chile, Argentina and Uruguay. In Brazil it has records for almost all the States, except Acre, Roraima. **Selected examined material:** RIO DE JANEIRO: **Arraial do Cabo,** Reserva Ecológica Estadual Massambaba, próximo à Lagoa de Araruama, sobre Clusiaceae, s.d., fr., *R.Paixão et al. 316* (RB). **Carapebus**, restinga de Jurubatiba, 18 mar. 2002, fl., fr., *D.S.D.Araújo 10720* (GUA). **Guapimirim,** Fazendas Consorciadas, 23 ago. 2000, fl., *F.M.B.Pereira 32/29* (RFA). **Macaé,** restinga de Carapebus, 16 jul. 1993, fr., *J.M.A.Braga and M.G.Bovini 439* (RUSU). **Magé,** s.loc., 5 jul. 1975, fl., *P.Occhioni 7516* (RB, RFA, RUSU); *ibidem,* área do Centro de Primatologia do Rio de Janeiro, sobre Olacaceae, 22 out. 1984, fr., *H.C.Lima et al. 2281* (RB). **Mangaratiba,** Reserva Rio das Pedras, trilha para Toca da Aranha, s.d. *C.H.R.dePaula* (*vidi vivum*). **Maricá,** picada do morro do Mololô, 21 nov. 1988, fr., *F.Agarez et al. 29* (RFA). **Mendes,** Fazenda São José das Paineiras, 12 set. 1993, fr., *T.U.P.Konno et al. 302* (RUSU). **Nova Friburgo,** Lumiar, Gaudinópolis, beira do rio Macaé, sobre Myrtaceae, 3 mar. 2001, fr., *C.H.R.dePaula et al. 318* (RUSU); *ibidem,* Macaé de Cima, nascente do rio das Flores, sobre *Guatteria* sp., 26 nov. 1986, fl., fr., *G.Martinelli et al. 11911* (RB). **Rio de Janeiro,** estrada das Furnas da Tijuca, 24 jun. 1958, fl., *P.Occhioni 1750* (RFA); *ibidem,***,** restinga da Marambaia, praia da Armação, estrada Lagoa vermelha, 19 jan. 2001, fr., *L.F.Teixeira 751* (RBR). **Saquarema,** Reserva Ecológica Estadual de Jacarepiá, restinga de Ipitangas, 25 jun. 1990, fr., *C.Farney et al. 2428* (RB). **Silva Jardim,** Reserva Biológica Poço das Antas, estrada Aristides km 4,6, 25 jan. 1995, fr., *J.M.A.Braga and S.J.S.Neto 1831* (RB, RUSU); *ibidem,* estrada para Juturnaíba, 22°30'S_42°19'W, 27 nov. 1992, fr., *H.C.Lima et al. 4537* (RB). **Teresópolis,** Parque Nacional da Serra dos Órgãos, Caneca-fina, 20 out. 1974, fl., fr., *P.Occhioni 6370* (RFA).
**Comments:** One of the most common species of the genus for all Brazil, being especially well recorded in the open pastures of Minas Gerais. Distinct from its congeners by the presence of spikes in the sheathing intercallary cataphylls and for leaves with conspicuous palmate nerves. When it bears fruit, the enormous amount of orange-colored fruits make it an extremely attractive to species for avifauna and collectors.

The Tikuna Indians (Amazon region) use the macerated leaves in wounds (Schultes & Raffauf 1999). Individuals of "gaturamo" had been observed (*Euphonia chlorotica* - Emberezidae) ingesting fruits of this species in Restinga of Maricá.

**2.5. *Phoradendron dipterum*[57]** Eichl. *in* Mart., Fl. bras., 5(2):109. 1868. **Type:** Brasil, Ceará, *Gardner 1672* (holotype W, destruído, isotypes BM, GH, K, P).
*Phoradendron amplexicaule* Eichl. *in* Mart., Fl. bras., 5(2): 110. 1868.
*Phoradendron multifoveolatum* Eichl. *in* Mart., Fl. bras. 5(2): 110, fig. 34. 1868.
*Phoradendron tovarense* Urb., Bot. Jahrb. Syst. 23, Beibl. 57:8. 1897.
*Phoradendron crulsii* Urb., Bot. Jahrb. Syst. 23, Beibl. 57:11. 1897.
*Phoradendron glaziovii* Urb., Bot. Jahrb. 23. Beibl. 57: 12. 1897.
*Phoradendron tetrapterum* Krug. *et* Urb., Bot. Jahrb.Syst. 24: 35. 1897.
*Phoradendron hypericifolium* Trel., Phoradendron: 72, fig. 91a. 1916.
*Phoradendron demerarae* Trel., Phoradendron: 73, fig. 91b. 1916.

[57] from stem with two (*di*) wings (*pterum*).

*Phoradendron amplectens* Trel., Phoradendron: 75. fig. 95a., b. 1916.
*Phoradendron casimiranum* Trel., Phoradendron: 71, fig. 88. 1916.
*Phoradendron auriculatum* trel., Bull. Torrey Bot. Club. 62: 338. 1935.
*Phoradendron longiarticulatum* Rizz., Rev. Fac. Agron. (Maracay) 8(3): 88, fig. 4. 1975.
Figures: 41, 42 and 43

PLANTS erect. STEMS and branches strongly quadrangular, to at times slightly winged in the angles, sheathing basal cataphylls on the internodes. LEAVES spatulate, ca. 5.5 x 2.0 cm, 3-5-nerved. INFLORESCENCES with one sterile, basal articulation and 3-4 floriferous with 9-23 flowers, 3x2 seried. FRUITS white or colored, perigone closed.

**Geographic distribution:** Brasil: PB, PE, BA, GO, DF, MG, RJ, SP, RS; Venezuela, Suriname, Colombia, Equador Peru, Paraguay and Argentina.
**Selected examined material:** RIO DE JANEIRO: **Nova Friburgo,** Lumiar, Toca da Onça, 22°23'27''S_42°19'03''W, 543 ms.m., sobre *Phoradendron crassifolium*, 4 jul. 2003, fr., *C.H.R.dePaula et al. 499* (RUSU). **Resende,** Visconde de Mauá, estrada Santa Clara-Maromba, sobre *Phoradendron* sp., 8 jul. 2001, fr., *C.H.R.dePaula et al. 336* (RUSU).
**Comments:** Plant of a peculiar habit frequently (or always) hyperparasitic on other species of *Phoradendron*, a fact not easily observed by the collectors, thus it results in diverse mixed collections. Generally *P. dipterum* is inserted on one internode of the parasitic host and emits profuse aerial branches that attributes the plant(s) a confused aspect. Generally the parasitic hosts possess cylindrical branches that contrast with the strongly quadrangular branches of *P. dipterum*.

**2.6. *Phoradendron falcifrons*[58]** (Hook. *et* Arn.)Eichl. in Mart., Fl. bras. 5(2): 134m. 1868.
*Viscum falcifrons* Hook. *et* Arn., Bot. Misc. 3:356. 1833. **Type:** Uruguay, em Lauráceas, *Tweedie* s.n. (holotype K).
*Phoradendron selloi* Eichl. *in* Mart., Fl. bras. 5(2): 116. 1868.
*Phoradendron subfalcatum* Abbiatti, Revta. Mus. La Plata, secc. Bot., 7: 97. 1946.
Figures: 45 and 47

PLANTS pendulous. STEMS ancipital, branches cylindrical; 1-2(4) sheathing cataphylls on the basal nodes, intercallary cataphylls absent. LEAVES 8.0 x 2.0 cm, narrowly elliptical, to at times falciform, apex rounded, base decurrent in indistinct petiole, 3-5 conspicuously palmately nerved. Male INFLORESCENCES with 1-2(3) sterile basal articulations and 3-4(5) floriferous with 8 flowers, 2(3)x2 seried; female with 1-2 sterile basal articulations and the 4 floriferous with 3-6 seried flowers 2(3) x 2. FRUITS white, with closed perigone.
**Geographic distribution:** Brasil: PA, PB, BA, MG, RJ, SP, RS; Bolivia, Paraguay, Uruguay, Argentina.
**Selected examined material:** RIO DE JANEIRO: **Teresópolis,** estrada para Campo Antas km 9 (1800 ms.m.), sobre *Belangera speciosa*, 26 maio 1949, fr., *C.T.Rizzini 510* (HPN).
**Additional selected material:** RIO GRANDE DO SUL: **Itapuã,** Viamão, sobre *Chrysophyllum marginatum*, set. 1983, fr., *M.Sobral and P.Brack 2245* (RB). ARGENTINA: **Entre Rìos,** Federación, 24 nov. 1976, fr., *N.S.Trancoso et al. 1393* (RB).

[58] from leaves (*frons*) in the form of a scythe (*falci*).

**Comments:** Despite the etimology of the specific epithet indicating falciform leaves, such a characteristic is not expressed in all individuals, thus it is very similar to *P. linearifolium*.

**2.7. *Phoradendron fragile*[59]** Urb., Bot. Jahrb. 23. Beibl. 57: 13. 1897. **Type:** Brasil, Rio de Janeiro: próximo ao Rio de Janeiro, nov. 1879, *Glaziou 10898* (lectotype B, designated by Trel., 1916, destruído; isolectotypes K, P)
Figures: 45, 46 and 47

Small PLANTS up to 20 cm in height. STEMS and branches cylindrical, with 5 sheathing cataphylls at the basal nodes. Leafless. INFLORESCENCES with 1-3 barren basal articulations and 3-5 floriferous with 4-7 (-13) seried flowers 3x2. FRUITS white, perigone closed.

**Geographic distribution:** Brasil: DF, MG, RJ, SP.
**Selected examined material:** RIO DE JANEIRO: **Nova Friburgo,** Muri, em Melastomataceae, 29 dez. 1950, fl., *B.Carris* s.n. (RB 72556). **Petrópolis,** estrada Rio-Petrópolis km 43, sobre *Miconia* sp., maio 1953, bt., *A.P.Duarte 3594* (RB). **Teresópolis,** Parque Nacional da Serra dos Órgãos, beira da estrada para a Barragem, sobre *Alchornea triplinervea*, 22 nov. 2003, fl., fr., *C.H.R.dePaula et al. 514* (HPN, R, RUSU); Área do Jardim, Bosque Santa Helena, em Melastomataceae, 22 jun. 1948, fr., *C.T.Rizzini 138* (RB).
**Additional selected material:** DISTRITO FEDERAL: **Brasília,** Estação Florestal Cabeça de Veado, 14 dez. 1980, fr., *E.P.Heringer et al. 5861* (RB). MINAS GERAIS: **Ibitipoca,** s.loc., 30 set., bt., *U.Confucio 9428* (RB). SÃO PAULO: **Serra da Bocaina,** sobre Myrtaceae, 16 maio 1951, fl., *A.C.Brade 21066* (RB).
**Comments:** This species is one of the most interesting of all the "mistletoes" in general. Considered a dioecious plant, absolutely male individuals are not known, thus the production of seeds and fruits is probably of apogamous origin, beyond possibly being holoparasites (Rizzini 1950a).

**2.8. *Phoradendron linearifolium*[60]** Eichl. *in* Mart., Fl. bras., 2: 115, pr. 36. 1868. **Type:** Brasil, Rio de Janeiro, cidade do Rio de Janeiro, *Riedel* s.n. (lectotype G designated by Trel., 1916; foto: Trel. 1916, fig. 181a; isolectotypes K, P).
Figures: 44, 45, 46 and 47

PLANTS pendulous. BRANCHES finely cylindrical with 2-3 basal sheathing cataphylls; intercallary sheathing cataphylls absent. LEAVES 0.6 x 8.0 cm, linear, apex round, base decurrent, trinerved, nerves conspicuous. Male INFLORESCENCES with 1-2 sterile basal articulations and 2-3 floriferous, with ca. of 13 seried flowers 3x2; female with 1-3 sterile basal articulations and 2-3 floriferous with only 3 seried flowers 2x2. FRUITS white, perigone closed.

**Geographic distribution:** Brasil: RJ, PR.
**Selected examined material:** RIO DE JANEIRO: **Magé,** E.E.Paraíso, fazenda Santa Rita, parcela 16, 22°21'S_42°27'W, sobre *Micropholis crassipedicelata*, 22 mar. 1992, fl., *A.M.S.F.Vaz et al. 969* (RB). **Nova Friburgo,** Lumiar, Toca da Onça,

[59] from the fragile aspect of the plants.
[60] from leaves (*folium*) linear, narrow.

42°19’59’’W_22°23’05’’S, 1066 ms.m., sobre *Piptadenia gonoacantha*, 4 jul. 2003, fl., fr., *C.H.R.dePaula et al. 507* (R, RUSU). **Teresópolis,** trilha para Pedra do Sino, 3 jun. 1999, fr., *C.H.R.dePaula and A.Lobão 174* (RUSU).
**Comments:** A plant characterized by the combination of thin branches and linear leaves, where the development of profuse associations individuals gives the plant a similar aspect to *Rhipsalis lindbergiana* (Cactaceae).

**2.9. *Phoradendron nigricans*[61]** Rizz., Rodriguésia 30-31: 187.1956. **Type:** Brasil, Rio de Janeiro, cidade do Rio de Janeiro, morro Queimado, 13 maio 1945, fr., *Occhioni 212* (holotype RB!).
*Phoradendron irwinii* Rizz., Arq. Jard. Bot.Rio de Janeiro 24: 33. 1980.
Figures: 47 and 49

PLANTS medium, erect. STEMS ancipital or quadrangular, branches cylindrical; 1 sheathing basal cataphyll, sheathing intercallary absent. LEAVES 3.0 x 7.0 cm, widely lanceolate, apex obtuse, base decurrent, 3-5 nerved, nerves conspicuous. INFLORESCENCES with 1 sterile basal articulation and 3-4 floriferous with 3 flowers seried 2x 2. FRUITS white, perigone closed.
**Geographic distribution:** Brasil: PE, BA, DF, MG, RJ.
**Selected examined material:** RIO DE JANEIRO: **Rio de Janeiro,** Morro do Archer, sobre Melastomataceae, 15 jul. 1958, fr., *Liene et al. 3997*(RB).
**Comments:** *P. nigricans* in herbarium material, has dark coloration, almost black, and the leaves have a rugulose surface, a characteristics that assists in the determination of the taxon.

**2.10. *Phoradendron obtusissimum*[62]** (Miq.) Eichl. *in* Mart., Fl. bras., 5 (2): 134. 1868.
*Viscum obtusissimum* Miq., Linnaea 18: 602. 1844. **Type:** Suriname, “para superiore”, setembro de 1844, *Focke 1019* (holotype U).
*Phoradendron acinacifolium* Mart. *ex* Eichl. *in* Mart., Fl. bras. 2: 117, pr 37, fig.1. 1868.
*Phoradendron craspedophylloides* Trel., Phoradendron: 92. 1916.
*Phoradendron acinacifolium* var. *surinamense* Rizz., Mem. New York Bot. Gard. 29: 32. 1978.
*Phoradendron ichytistoma* Rizz., Ernstia 24: 9. 1984.
*Phoradendron acinacifolium* f. *microcarpum* Kuntz., Revis. gen. Pl. 3:282.1989.
Figures: 46, 47 and 49

PLANTS robust, yellowish. STEMS ancipital, branches cylindrical; 1 sheathing basal cataphyll, intercallary sheaths absent. LEAVES 3.0 x 10.0 cm, elliptical, oblong or lanceolate, apex round, base decurrent, trinerved, nerves inconspicuous. INFLORESCENCES with 2 sterile basal articulations and 3 floriferous with 3-6 seried flowers 2x2. FRUITS hyaline, perigone open.

**Geographic distribution:** Brasil: AM, AC, PA, MA, RN, PE, BA, MS, ES, RJ; Costa Rica, Panamá, Venezuela, Colombia, Suriname, Equador, Peru.
**Selected examined material:** RIO DE JANEIRO: **Araruama,** Praia Seca, sobre *Schinus therebinthifolius*, 13 jun. 1998, fl., fr., *C.H.R.dePaula et al. 56* (RUSU). **Arraial do Cabo,** R. E. E. Massambaba, próximo à Lagoa de Araruama, 20 out. 1994, fl. fr., *R.Paixão et al. 284* (RB);

[61] becoming black (when dry).
[62] from the obtuse leaf apex.

*ibidem*, s.loc., 8 maio 2003, fr., *D.S.D.Araújo 10824* (GUA). **Maricá,** restinga de Maricá, sobre *Myrsine* sp., 22 jun. 2003, fr., *C.H.R.dePaula 490* (RUSU).
**Comments:** One of the "mistletoes" most typical of the Restinga, where its green-yellowish branches associated with the ellipsoidal fruits with an open perigone characterize the species.

**2.11. *Phoradendron piperoides*[63]** (Kunth.)Trel., Phoradendron 145, figs. 217-222. 1916.
*Loranthus piperoides* Kunth, Nov. gen. sp. 3: 443. 1818. **Type:** Colombia, Cauca, Popayán, 1871, *Humboldt & Bonpland* s.n. (holotype P).
*Phoradendron schottii* (Pohl ex DC.) A. Gray, U.S. Explor. Exped. [Bot., Phanerogam.] 15: 742. 1854.
*Phoradendron latifolium* (Swartz) Griseb., Fl. Brit. W. I. 314. 1864.
*Phoradendron laurifolium* (Presl.) Eichler *in* Mart., Fl. bras. 5(2): 107. 1868.
*Phoradendron torulosum* (Kunth) Eichl. *in* Mart., Fl. bras. 5 (2): 134m. 1868.
*Phoradendron latifolium* f. *hexastichum* Urban, Bot. Jahrb. Syst. 23, Beibl. 57: 3. 1897.
*Phoradendron biolieyi* Krause, Notizbl. Bot. Gart. Berlin-DahIem 5: 264. 1912.
*Phoradendron piperoides* f. *compositum* Trel., Phoradendron 148. 1916.
*Phoradendron ficulneum* Trel., Repert. Spec. Nov. Regni Veg. 25: 55. 1928.
*Phoradendron morawnense* Standley & L. O. Williams, Ceiba 3: 197. 1953.
*Phoradendron glauco-lutescens* Rizz., Rodriguésia 41: 23. 1976.
Figures: 48, 49, 50 and 53

PLANTS erect medium or pendulous. STEMS and branches cylindrical, 2-3 basal sheathing cataphylls, 1 intercallary sheathing cataphyll. LEAVES elliptical lanceolate or, apex acute, base acute, nerves palmate, inconspicuous. INFLORESCENCES with 2-4 sterile basal articulations and 5-8 floriferous with up to 15 seried flowers 2x2. FRUITS orange, perigone open.

**Geographic distribution:** Central and South America except Chile and Uruguay.
**Selected examined material:** RIO DE JANEIRO: **Angra dos Reis,** Ilha Grande, praia da sul, R.B.E.P.S., 29 set. 2002, fr., *R. Scheel-Ybert et al.* 260 (GUA); *ibidem*, vila de Dois Rios, s.d., fr., *F.Pinheiro et al. 334* (HB). **Armação de Búzios,** Praia Gorda, 17 dez. 1998, fl., *A.Lobão et al. 406* (RB). **Casimiro de Abreu,** Sana, camping do Bambuzal, sobre *Guarea guidonia* and *Ficus* sp., 13 mar. 1999, fl., fr., *C.H.R.dePaula 115* (RUSU). **Macaé,** restinga de Carapebus, sobre *Rapanea* sp., 19 set. 1998, fr., *C.H.R.dePaula 75* (RUSU). **Mangaratiba,** Reserva Rio das Pedras, trilha do Cambucá, sobre *Guarea guidonia*, 22 mar. 1999, fl., fr., *C.H.R.dePaula et al. 118* (RUSU). **Maricá,** restinga de Maricá, sobre *Rapanea* sp., 14 jun. 2000, fr., *C.H.R.dePaula et al. 248* (RUSU); *ibidem*, 22°57'258''S_42°53'180''W, sobre Myrtaceae, 22 jun. 2003, fr., *C.H.R.dePaula 489* (RUSU). **Nova Friburgo,** Lumiar, Toca da Onça, sobre Sapotaceae, 4 jul. 2003, fr., *C.H.R.dePaula et al. 500* (RUSU). **Saquarema,** R.E.E. Jacarepiá, s.d., fr., *J.Fontella and R.Paixão 3085* (RB). **Silva Jardim,** trilha do morro do Calcário, 22°03'S_42°09'W, 8 jan. 1993, *L.Sylvestre et al. 817* (RB). **Rio de Janeiro,** morro da Prainha, sobre *Guarea guidonia*, 10 jul. 2003, fr., *C.H.R.dePaula and A.Calvente 509* (RUSU).
**Comments:** One of the most common *Phoradendron* in Brazil, it produces an enormous amount of fruit that when mature acquire an intense orange coloration. Although it is a generalist plant in relation to its hosts, a great affinity for *Guarea guidonia* (L.)Sleum. (Meliaceae) in forest areas is

[63] from spikes that look like those of *Piper* (genus of Piperaceae).

noticed, mainly in disturbed areas where this tree is one of most common, and for *Myrsine* spp. (Myrsinaceae) in Restingas. In the forests one can find it inserted on the branches of the sub-forest, being then shade-loving plants and having pendulous branches, leaves less thick, and all the plant with a green-dark tonality. In Restingas, more exposed to the sun, stems are shorter and more erect, the extremely thick leaves and all the plant, especially the leaves, acquire a yellowish-green coloration.

**2.12. *Phoradendron pteroneuron*[64]** Eichl. *in* Mart., Fl. bras., 5(2): 127. 1868. **Type:** Brasil, Rio de Janeiro, perto do Rio de Janeiro, *Glaziou 1462* (lectotype BR, isolectotype BR, designated by Kuijt 1994).
*Phoradendron rugulosum* Urb., Bot. Jahrb. Syst. 23, Beih. 57: 13. 1897.
*Phoradendron warmingii* var. *rugulosum* (Urb.)Rizz., Revta. Bras.Biol. 51: 459. 1991.
Figures: 51 and 53

PLANTS robust. STEMS quadrangular, ancipital, branches angular or cylindrical; 2-4 basal sheathing cataphylls, sheathing intercalate absent. LEAVES 9.0x 5.0 cm, obovate or elliptical, apex widely rounded, base obtuse, nerves palmate weakly conspicuous. INFLORESCENCES with 2-6 sterile basal articulations and 3-7 floriferous with 5-7 flowers, 2x2 seried. FRUITS of unknown coloration, perigone closed.

**Geographic distribution:** Brasil: AM, AP, BA, MT, MS, MG, RJ, SP; Colombia, Venezuela, Suriname, Bolivia.
**Selected examined material:** RIO DE JANEIRO: **Nova Friburgo,** Macaé de Cima, nascente do rio das Flores, em Lauraceae, 25 maio 1987, fl., *G.Martinelli et al. 12087* (FCAB, RB, SP); *ibidem*, caminho para os Pirineus, 22º33'S_42°30'W, 16 ago. 1989, fl., *C.M.Vieira et al. 55* (K, RB). **Teresópolis,** mata da margem do rio Paquequer, 890 ms.m., 11 jun. 1949, fr., *Brassi 28* (HPN); *ibidem*, estrada Campo das Antas km 8, 1700 ms.m., parasita sobre diversas espécies arbóreas, 14 mar. 1950, fr., *A.Barbosa 415* (HPN).
**Additional selected material:** AMAZÔNIA: **Rio Negro,** Tapuruquara, em goiabeira, 7 maio 1947, fr., *J.M.Pires 238* (RB). BAHIA: **Jacobina,** Serra do Tombador, sobre *Byrsonima sericea,* 23 dez. 1984, fl., *R.Mello-Silva et al.* s.n. (RB 288761). CEARÁ: **Araripe,** dez. 1945, fr., *R.Miranda 37* (RB). MINAS GERAIS: **Cristália,** Sonora, *Jacaranda* sp., 19 jul. 1998, fl., *G.Hatschbach et al. 68081* (RB). MATO GROSSO: **Garapú,** 13°12'S_52°34'W, em *Sclerolobium* sp., 2 out. 1964, fl., *H.S.Irwin and T.R.Soderstrom 5580* (RB). GUIANA INGLESA: **Monte Ayangana,** 16 ago. 1960, fr., *S.S.Tillet et al. 45162* (RB). VENEZUELA: **Sierra de San Luis,** 1100 ms.m., em *Ficus* sp., 11 jul. 1979, bt., fl., fr., *F.Falcón 898* (RB).
**Comments:** *P. pteroneuron* is easily recognized by the bright aspect and copper coloration of the live plant, together with leaves with evident nerves and the inflorescences with some sterile basal articulations.

[64] nerve (*neuron*) winged (*pteros*), for wide leaves with perceptible nervation.

**2.13. *Phoradendron quadrangulare*[65]** (Kunth.) Griseb., Fl. Brit. W.I.: 711. 1864.
*Loranthus quadrangularis* Kunth., Nov. gen. sp. 3:44. 1818. **Type:** Colombia, Cundinamarca, próximo a Pandí and Fusagasugá, sobre *Guazuma*, set. 1795, *Humboldt and Bonpland* s.n. (holotype P).
*Loranthus viscifolium* Kunth., Nov. gen. sp. 3: 443. 1818.
*Viscum angustifolium* Bertero *ex* Sprengel, Syst. veg. l: 487. 1824
*Viscum quadrangularis* (Kunth.) DC., Prodr. 4: 283. 1830.
*Viscum kunthianum* DC., Prodr.4: 283. 1830.
*Viscum salicifolium* Presl., Epimel. Bot. 254. 1851.
*Phoradendron salicifolium* (Presl.) Eichl. *in* Mart., Fl. bras. 5(2): 110. 1868.
*Phoradendron rubrum* var. *longispicum* Eichl.*in* Mart., Fl. bras. 5(2): 121. 1868.
*Phoradendron quadrangulare* var. *gracile* Krug & Urban, Bot. Jahrb. Syst. 24: 37. 1897.
*Phoradendron rubrum* var. *gracile* (Krug & Urban) Fawcett & Rendie, Fl. Jamaica 3: 96. 1914.
*Phoradendron guawmae* Trel., Phoradendron 104, Fig. 148. 1916.
*Phoradendron rensonii* Trel., Phoradendron 105, Fig. 149. 1916.
*Phoradendron commutatum* Trel., Phoradendron 106, Fig. 150b. 1916.
*Phoradendron viscifolium* (Kunth.)Trel., Phoradendron 109, Fig. 155. 1916.
*Phoradendron piauhyanum* Trel., Phoradendron 110. 1916.
*Phoradendron ceibanum* Trel., Phoradendron 110, Fig. 158. 1916.
*Phoradendron venezuelense* Trel., Phoradendron 111, Fig. 159a. 1916.
*Phoradendron antiliarum* Trel., Phoradendron 111, Fig. 159. 1916.
*Phoradendron antiliarum* var. *orientale* Trel., Phoradendron 112, Fig. 161a. 1916.
*Phoradendron antiliarum* f. *longum* Trel., Phoradendron 112, Fig. 161b. 1916.
*Phoradendron gracile* (Krug & Urban) Trel., Phoradendron 112, Fig. 162a. 1916.
*Phoradendron townsendii* Trel., Phoradendron 112, Fig. 162b. 1916.
*Phoradendron gracile* var. *ballii* Trel., Phoradendron 112, Fig. 163b. 1916.
*Phoradendron martianum* Trel., Phoradendron 114. 1916.
*Phoradendron gaumeri* Trel., Phoradendron 114, Fig. 167a. 1916.
*Phoradendron tamaulipense* Trel., Phoradendron 115, Fig. 167b. 1916
*Phoradendron zacapanum* Trel., Phoradendron 115, Fig. 168a, b. 1916.
*Phoradendron randiae* (Bello) Britton, Bot. Porto Rico 5: 257. 1924.
*Phoradendron rusbyanum* Trel., Mem. New York Bot. Gard. 7: 234. 1927.
*Phoradendron huricola* Trel., Bull. Torrey Bot. Club 54: 471. 1927.
*Phoradendron milispaughii* Trel., Bull. Torrey Bot. Club 54: 475. 1927.
*Phoradendron moringicola* Trel., Repert. Spec. Nov. Regni Veg. 26: 343. 1929.
*Phoradendron rehderianum* Urban, Ark. Bot. 23A(5): 62. 1930.
*Phoradendron belizense* Trel., Field Mus. Nat. Hist., Bot. Ser. 12: 409. 1936.
*Phoradendron cayanum* Trel., Field Mus. Nat. Hist., Bot. Ser. 12: 409. 1936.
*Phoradendron cocquericotanum* Trel., Field Mus. Nat. Hist., Bot. Ser. 13(2): 410. 1936.
*Phoradendron manatense* Trel., Field Mus. Nat. Hist., Bot. Ser. 12: 410. 1936
*Phoradendron franciscanum* Trel., Field Mus. Nat. Hist., Bot. Ser. 17: 236. 1937.
*Phoradendron libertadanum* Trel., Field Mus. Nat. Hist., Bot. Ser. 17: 236. 1937.
*Phoradendron petenense* Trel., Field Mus. Nat. Hist., Bot. Ser. 17: 237. 1937.
*Phoradendron paquitanum* Trel., Publ. Field Mus. Nat. Hist., Bot. Ser. 18: 405. 1937.

[65] from quadrangular stems.

*Phoradendron sonanum* Trel., Ann. Missouri Bot. Gard. 27: 308. 1940.
*Phoradendron herrerense* Trel., Ann. Missouri Bot. Gard. 27: 307. 1940.
*Phoradendron randiae f. longum* (Trel.) Stehlé, Bull. Soc. Bot. France, Mém. 1953-1954: 25. 1954.
*Phoradendron randiae* var. *orientale* (Trel.) Stehlé, Bull. Soc. Bot. France, Mém. 1953-1954: 25. 1954.
*Phoradendron venezuelense* var. *filispicum* Rizz., Ernstia 24: 3. 1984.
*Phoradendron rubrum* var. *longipedunculatum* Rizz., Ernstia 32: 9. 1985.
Figures: 50, 51 and 53

PLANTS delicate, dark green when living. STEMS strongly quadrangular, branches cylindrical; 1 sheathing basal cataphyll, sheathing intercallary absent. LEAVES ca. 7.0 x 2.5 cm, spatulate or lanceolate, apex rounded, base decurrent, trinerved, nerves conspicuous. INFLORESCENCES with 1 sterile basal articulations, 3-5 floriferous with 3-7 seried flowers 2x2. FRUITS orange, perigone closed.

**Geographic distribution:** Central and South America except Chile and Uruguay.
**Selected examined material:** RIO DE JANEIRO: **Caxias,** Reserva da Petrobrás, 22°33'S_43°16'W, estrada para Represa da CEDAE, sobre Bignoniaceae, 30 mar. 1999, fr., *C.H.R.dePaula et al. 146* (RB). **Mangaratiba,** Reserva Ecológica Rio das Pedras, lado direito da estrada de entrada, sobre Bignoniaceae, 22 mar. 1999, fr., *C.H.R.dePaula et al. 116* (RUSU). **Maricá,** s.loc., 1991, fr., *R.Monteiro 100* (RFA). **Cabo Frio,** praia do Peró, 14 fev. 1985, fr., *D.S.D.Araújo 6686* (GUA). **Rio de Janeiro,** Urca, trilha para o morro da Urca, sobre *Erythroxylum* sp., abr. 1999, fr., *C.H.R.dePaula and B.B.Leite 127* (RUSU); *ibidem*, Penha, Parque Ary Barroso, 16 out. 1965, fr., *H.E.Strang 668* (GUA). **São João da Barra,** em *Diospyrus* sp., 16 maio 1989, fr., *D.S.D.Araújo 8855* (GUA). **São Pedro D'Aldeia,** morro do Farinha, 1 jun. 1989, fr., *D.S.D.Araújo and H.C.Lima 8986* (GUA). **Saquarema,** Reserva Estadual de Massambaba, 27 ago. 1991, fr., *G.V.Sommer 663* (RBR).
**Comments:** This species of *Phoradendron* has the largest geographic distribution (Kuijt 2003). Very common in the State of Rio de Janeiro, where frequently it is observed on Bignoniaceae (*Tabebuia* spp., *Sparattosperma* spp.) but also on Erythroxylaceae (*Erythroxylum pulchrum* St-Hil.) and Meliaceae [*Guarea guidonia* (L.) Sleum.]. It is characterized immediately by the fragile aspect of the finely quadrangular branches and by few spatulate leaves. All of the plant has a dark-green coloration when living that contrasts with the orange-colored fruits.

**2.14. *Phoradendron strongylocladus*[66]** Eichl. *in* Mart., Fl. bras., 5 (2): 109. 1868. **Type:** Brasil, Pernambuco, ilha de Itamavia, *Gardner 1029* (holotype B, destruído, isotypes BM, GH, K, NY, P)
*Phoradendron gardnerianum* Urb., Bot. Jahrb.Syst. 23, Beibl. 57: 11. 1897.
*Phoradendron surinamense* Pull., Enum. Vasc. Plants Surinam 155. 1906.
*Phoradendron caesalpiniae* Ule, Bot. Jahrb. Syst. 42: 200. 1908.
*Phoradendron essequibense* Trel., Phoradendron 149, fig. 223b. 1916.
*Phoradendron jonhstonii* Trel., Phoradendron 149. 1916.
Figures: 51 and 53

[66] for stem (*cladus*) rounded, compact (*strongylus*).

PLANT medium. STEMS and branches cylindrical; 1 basal sheathing cataphyll, intercallary cataphyll absent. LEAVES 2.0 x 4.0 cm, lanceolate or ovate-elliptical, apex and base acute, trinerved, nerves weakly conspicuous. INFLORESCENCES with 1(2) sterile basal articulations and 3-5 floriferous with 3 seried flowers 2x2. FRUITS yellowish, perigone open.

**Geographic distribution:** Brasil: AP, MA, BA, MT, GO, DF, MG, RJ, PR; Colombia, Venezuela, Bolivia.
**Selected examined material:** RIO DE JANEIRO: **Bom Jesus de Itabapoana,** Carabuçú, fazenda de Seu Jorge, 7 jun. 1982, fl., *J.P.P.Carauta et al. 4280* (GUA, R).
**Additional selected material:** AMAPÁ: **Igarapé Ariramba,** 1°13'N_51°3'W, em *Bauhinia* sp., 4 ago. 1962, bt., *J.M.Pires and P.B.Cavalcante 52333* (RB). BAHIA: **Santa Cruz de Cabrália,** 16°22'S_39°01'W, 17 mar. 1974, fr., *R.M.Harley 17078* (RB). DISTRITO FEDERAL: **Brasília,** Bacia do Rio São Bartolomeu, 27 maio 1981, fr., *E.P.Heringer et al. 6991* (RB). MATO GROSSO: **Córrego do Gato,** 12°49'S_51°96'W, em Leguminosae, 3 out. 1968, fr., *R.M.Harley et al. 10451* (RB). VENEZUELA: **Sucre,** Península Manare, em *Ouratea* sp., 11 set. 1973, fl., fr., *J.A.Steyermark et al. 108070* (RB).
**Comments:** A plant typical of open pastures, with the material of J.P.P.Carauta et al. 4280 being the first and only record for Rio de Janeiro and consequently, to present, for the Atlantic Mata.

**2.15. *Phoradendron tunaeforme*[67]** (DC) Eichl. *in* Mart., Fl. bras., 2:113, pr. 32. 1868.
*Viscum tunaeforme* DC., Prodr. 4: 284. 1830. **Type:** Brasil, Serra de São Feliz, Mosquitos, *Pohl. 1928* (holotype G, isotypes ILL, M, P)
Figures: 52 and 54

PLANTS pendulous, nodes flattened, green. Leafless. INFLORESCENCES with 1 sterile basal articulation and 1(-2) floriferous with 3 flowers, 3x2 (-2x2) seried. FRUITS white, perigone open.

**Geographic distribution:** Brasil: PA, CE, PB, PE, BA, GO, DF, MG, RJ, SP; Venezuela.
**Selected examined material:** PARAÍBA: **Maturéia,** caminho para o Pico do Jabre, sobre *Croton* sp., 3 ago. 2001, fl., fr., *C.H.R.dePaula 337* (R, RUSU).
**Comments:** The record of this species for Rio de Janeiro was made by Eichler (1868), based on unicate material (Vauthier s.n.) proceeding from the region of the *Dryades* (Atlantic Mata), being the others four materials for it cited, proceeding from regions of the Oreas and Hamadryas, or either, Cerrados and Caatingas respectively. This species was observed and collected by the author in the interior of the State of the Paraíba and later observed in Pernambuco, always in the areas of Hinterland. The pendulous, leafless branches, together with the articulated branches are similar to flattened and lustrous cladodes, thus conferring to this entity an extremely cactiforme aspect, immediately calling to mind epiphytic plants of the genera *Schlumbergera* and *Rhipsalis* of the Cactaceae. The host of this individual infested with these parasites on a few branches, can suggest to one an endophytic origin of the same ones, however, it is known that some dispersed seeds of *Phoradendron* are in rows on the same branch (Restrepo 1987).

[67] from aspect similar to a "tuna cactus", common name given to diverse Cactaceae. [*Opuntia ficus-indica*].

**2.16. *Phoradendron undulatum*[68]** (Pohl. *ex* DC.) Eichl. *in* Mart., Fl. bras. 5(2): 122, pr. 39. 1868.
*Viscum undulatum* Pohl. *ex* DC., Prodr., 4: 282.1830. **Type:** Brasil, Minas Gerais, Barbacena, 1828, *Pohl*. s.n. (holotype G).
Figures: 52, 53 and 54

PLANTS robust. STEMS more or less flattened, ancipital, branches cylindrical, ancipital. 2-3 basal sheathing cataphylls, intercallary sheathing cataphylls absent. LEAVES 13.0 x 4.0 cm, lanceolate, apex acute, base acute, at times decurrent, nerves pinnate, inconspicuous. INFLORESCENCES with 2-5 sterile basal articulations and 5-10 floriferous with 5-7 flowers, 2x2 seried. FRUITS white, perigone closed.

**Geographic distribution:** Brasil: RR, AM, PE, GO, BA, ES, RJ, SP, PR, SC, RS; Mexico, América Central, Colombia, Venezuela, Equador, Peru, Bolivia.
**Selected examined material:** RIO DE JANEIRO: **Itatiaia,** estrada para o Planalto km 8-9, 1400 ms.m., sobre Malpighiaceae, 15 mar. 1975, fr., *P.Occhioni 7081* (RFA). **Resende,** Visconde de Mauá, Maromba, caminho para o Poção, 8 jul. 2001, fl., *C.H.R.dePaula et al. 335* (RUSU). **Teresópolis,** margem do rio Paquequer, 9 mar. 1949, fr., *C.T.Rizzini 489* (HPN); *ibidem*, lado direito do prédio do herbarium, sobre *Cupania* sp., 14 dez. 2003, fl. *C.H.R.dePaula et al. 516* (HPN, R, RUSU).
**Comments:** Species easily found in dense forested sunny areas, mainly in the mountainous and high- mountainous formations. It is characterized by being an extremely foliose plant and these after droughts, have a visibly wavy margin.

## FINAL CONSIDERATIONS

Amongst the species confirmed to occur in the State, these are considered endemic: *Struthanthus armandianus, S. maricensis, S. dorothyi, S. pentamerus* and *Psittacanthus pluricotyledonarius* (except *S. polyrhizus* var. *oblongifolius*).

Wide dispersal was observed for *Eubrachion ambiguum, Phthirusa pyrifolia, Psittacanthus robustus, P. dichrous, Struthanthus marginatus* var. *marginatus, S. polyrhizus* var. *polyrhizus*, *S. syringifolius, Tripodanthus acutifolius*, beyond the majority of the species of *Phoradendron*, except *P. fragile P. linearifolium* and *P. nigricans*, that until the moment are endemic to Brazil.

Some species such as *Phoradendron tunaeforme, Eubrachion ambiguum* and *Phthirusa pyrifolia* are of doubtful occurrence for the State, therefore they count only from records in the literature, and amongst the consulted herbaria, collections of these species had not been located in Rio de Janeiro. Others such as *Antidaphne schotii* and *Phthirusa janeirensis*, reported in the literature as endemic to the State of Rio de Janeiro, are probably extinct because of the total lack of collections.

The species most common in the State of Rio de Janeiro are *Phoradendron undulatum*, *P. dipterum, P. quadrangulare, Struthanthus andrastylus, S. concinnus and S. staphylinus* var. *staphylinus* in the Matas and *Phoradendron bathyoryctum, P. obtusissimum* and *Phthirusa*

[68] for the edges of the leaves that typically become wavy when dry.

*podoptera* in Restingas, moreover *Phoradendron crassifolium, P. piperoides* and *Psittacanthus dichrous* are found in both environments.

In anthropic areas in general, *Struthanthus marginatus* var. *marginatus* and *S. vulgaris*, are common in that they are copiously developed in urban areas on exotic plants used in arborization, especially "almond tree-of-the-beach" (*Terminalia catappa* L. - Combretaceae), primarily "mango" (*Mangifera indica* L. Anacardiaceae), and secondarily "casuarinas" (*Casuarina equisetifolia* L. - Casuarinaceae), a fact previously observed (Paula et al. 2001).

The relationship between parasites and hosts varies from very wide in *Struthanthus marginatus*, *S. concinnus*, *Phoradendron piperoides*, *P. crassifolium* and *Psittacanthus dichrous*, to very restricted as seen in *Antidaphne glaziovii* on *Croton* spp., *Psittacanthus robustus* on *Vochysia* spp. and *Phoradendron fragile* on *Tibouchina* spp. (rarely *Alchornea* spp. and Myrtaceae). Perhaps amongst the groups most favorable to the establishment of "mistletoe", the families Bignoniaceae, Fabaceae, Myrsinaceae and Asteraceae are distinguished, the main one being Myrtaceae and within this [family] frequently *Psidium guaiava* L., in that it has been observed many different times hosting "mistletoe," however, never more than one species at the same time.

The genus *Struthanthus* can be considered the most complex, therefore it presents the largest number of infra-specific taxa and has narrow taxonomic alliances with both *Phthirusa*, *Cladocolea* and *Ixocactus*, this then being the group with greatest necessity for a taxonomic revision that better defines their generic limits, starting with the legitimation of *S. maricensis*. Equally complex are *Dendrophthora* and *Phoradendron* whose dividing lines are tenuous, and for the last genus, many species such as *Phoradendron chrysocladon* and *P. strongylocladus* are little known in the State.

The species *Cladocolea alternifolia* and *Ixocactus clandestinus* are rare plants that occur in very distant geographic locations, exactly on the other side of the continent as their respective congener species; in this work, the area of occurrence of *C. alternifolia* was extended with the discovery of two new populations, one in the city of Saint Maria Madalena and another one in the city of Rio de Janeiro, both in protected areas. *Phoradendron dipterum, P. fragile* and *Tripodanthus acutifolius* are still distinguished as the species with the most peculiar biology amongst those observed in this study, the first one being essentially hyperparasitic, the second for its reduced aspect, host specificity, intense endophytic proliferation and probable apogamous origin of seeds, and the last for its variation in habit (tree, scandent or epiphyte) and the consequent variation of parasitic form (caulinar or radicular), characteristics that distinguish these species from others.

The diversity of mistletoes is related to the intimate relationship with and presence and diversity of host trees, as well as to the existence of appropriate dispersal agents, a unique combination of requirements that is becoming more scarce with time. One is allowed to assume still that the development of specific canopy studies will probably bring to light not only new species, but will as well disclose other mechanisms related to the biology of these plants, as for example information on pollination.

Despite a vast literature on mistletoes, diverse generic taxonomic studies involving taxa and respective species, and where identification keys are supplied, diagnostic typification, characterizations, information on geographic distribution and illustrations, are scarce for Brazil and absent for the State of Rio de Janeiro as a whole. The present work constitutes the first effort in this direction, and also contributes to the common knowledge of these three families, which represent the totality of the occurrences of aerial parasites in Brazil, thus forming the base upon

which future taxonomic and ecological studies could be developed.

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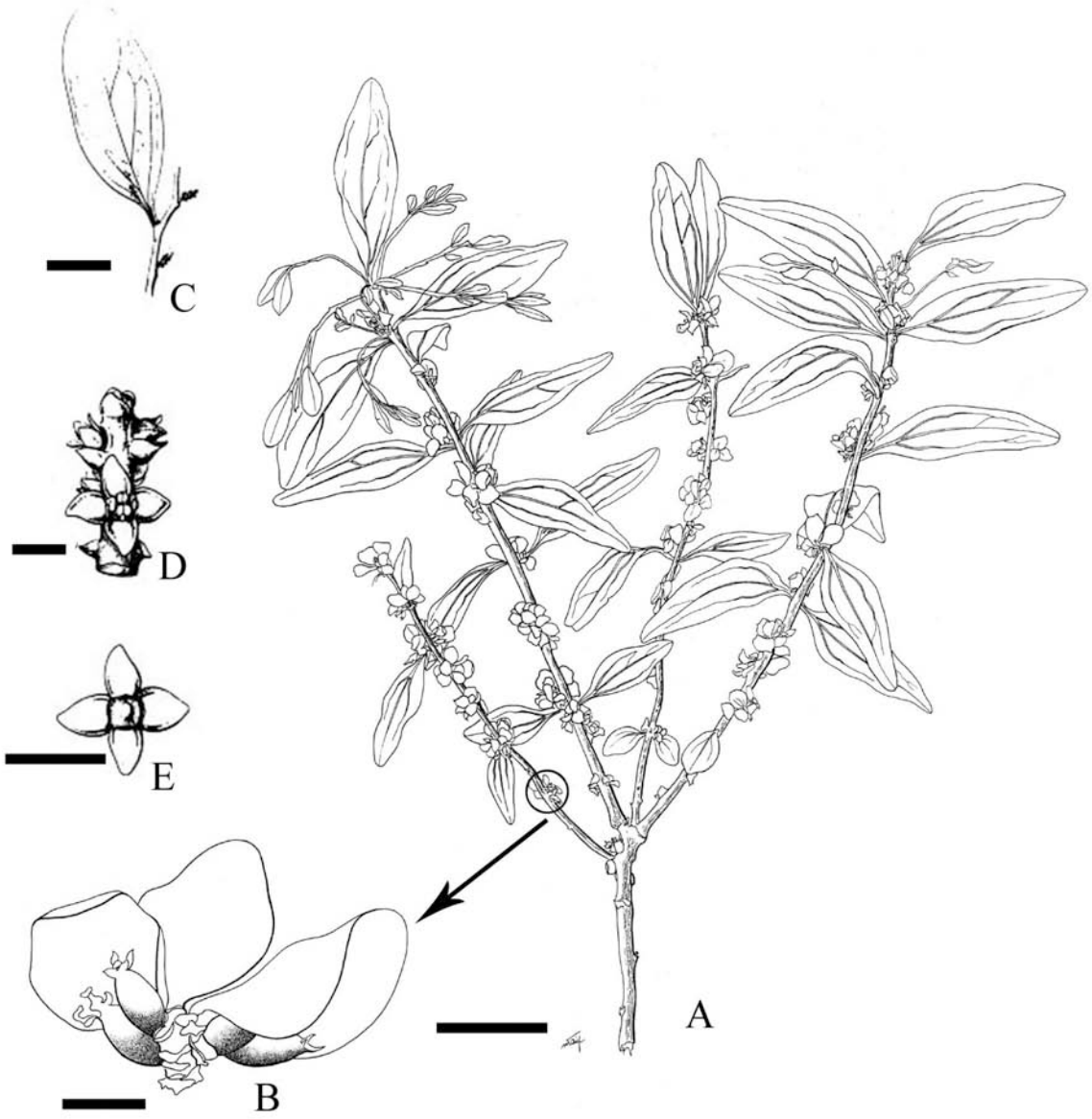


**Figure 1 -** ***Antidaphne glaziovii*** **(Tiegh.) Kuijt**: A - aspect of the fruiting branch (bar = 3 cm); B - infructescence detail (bar = 5 mm) (*C.H.R. dePaula et al. 186*). ***A. schotii*** **(Eichl.) Kuijt:** C - flowering branch (bar = 3 cm); D - detail of male spike (bar = 1 mm); E - detail of the female flower (bar = 1 mm) (modified from Eichler 1868).

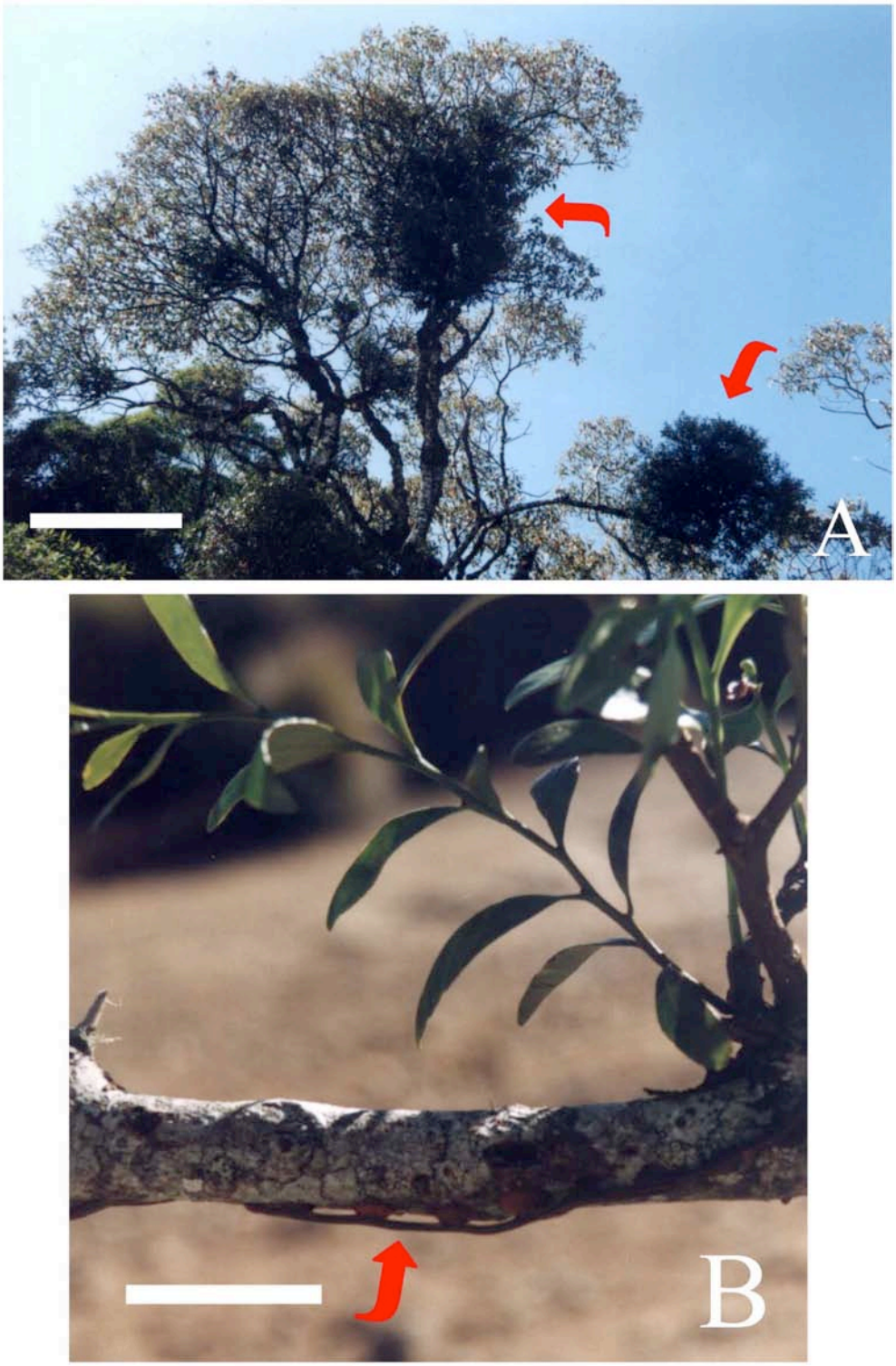


**Figure 2 - *Antidaphne glaziovii* (Tiegh.) Kuijt**: A – two large individuals (↪) on *Croton sp.* in Itatiaia (bar = 2m); B - detail of young individual on branch of the host, showing epicortical roots (↪) with haustorial disks (bar = 2 cm).

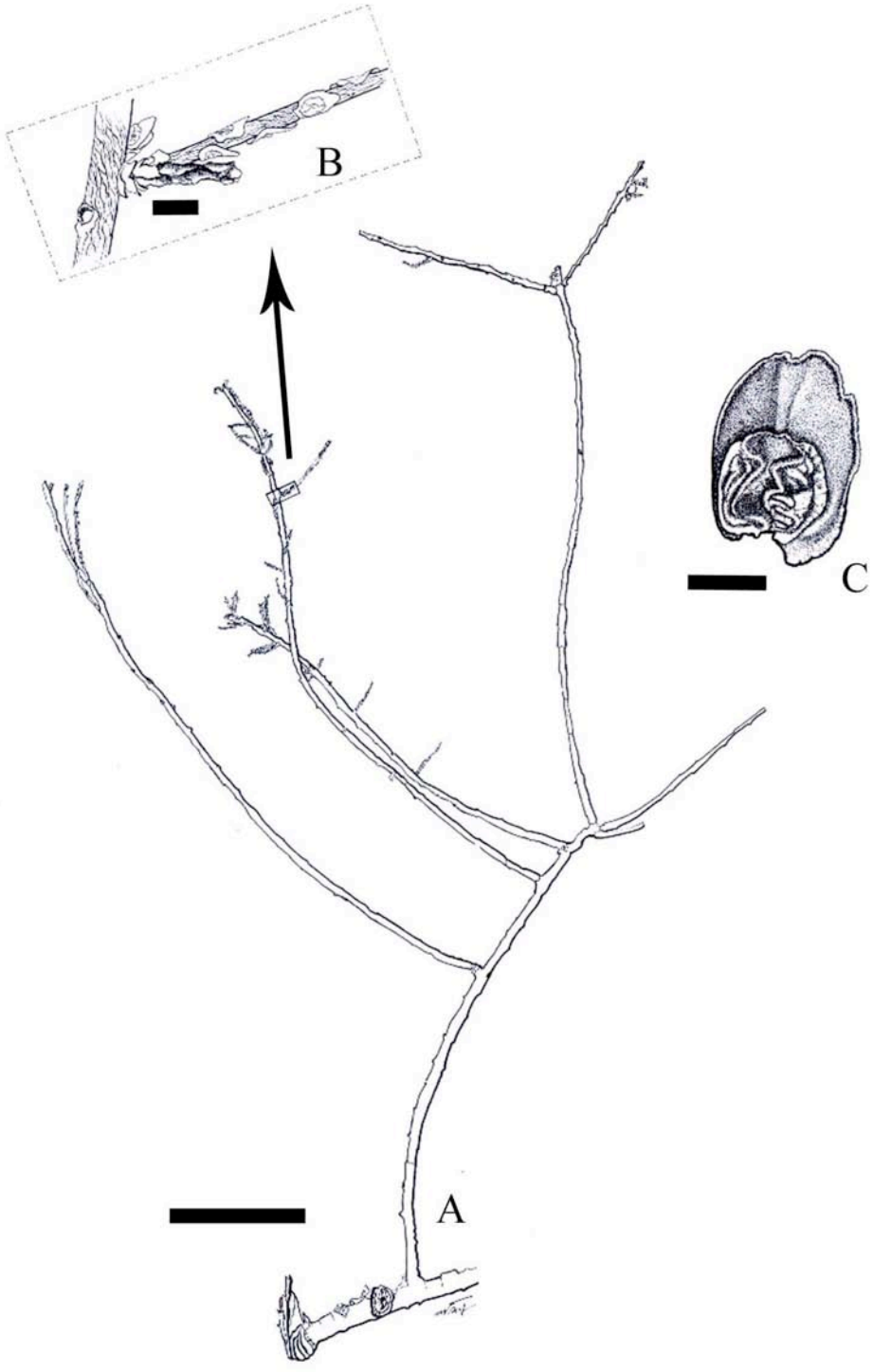


**Figure 3 -** ***Eubrachion ambiguum*** **(Hook. e*t* Arn.) Engl.**: A- flowering branch (bar = 5cm); B- detail of branch bearing scales (bar = 3 mm); C- isolated scale (bar = 1 mm) (*G.Hatschbach 17698 and J.P.P.Fontella 211*).

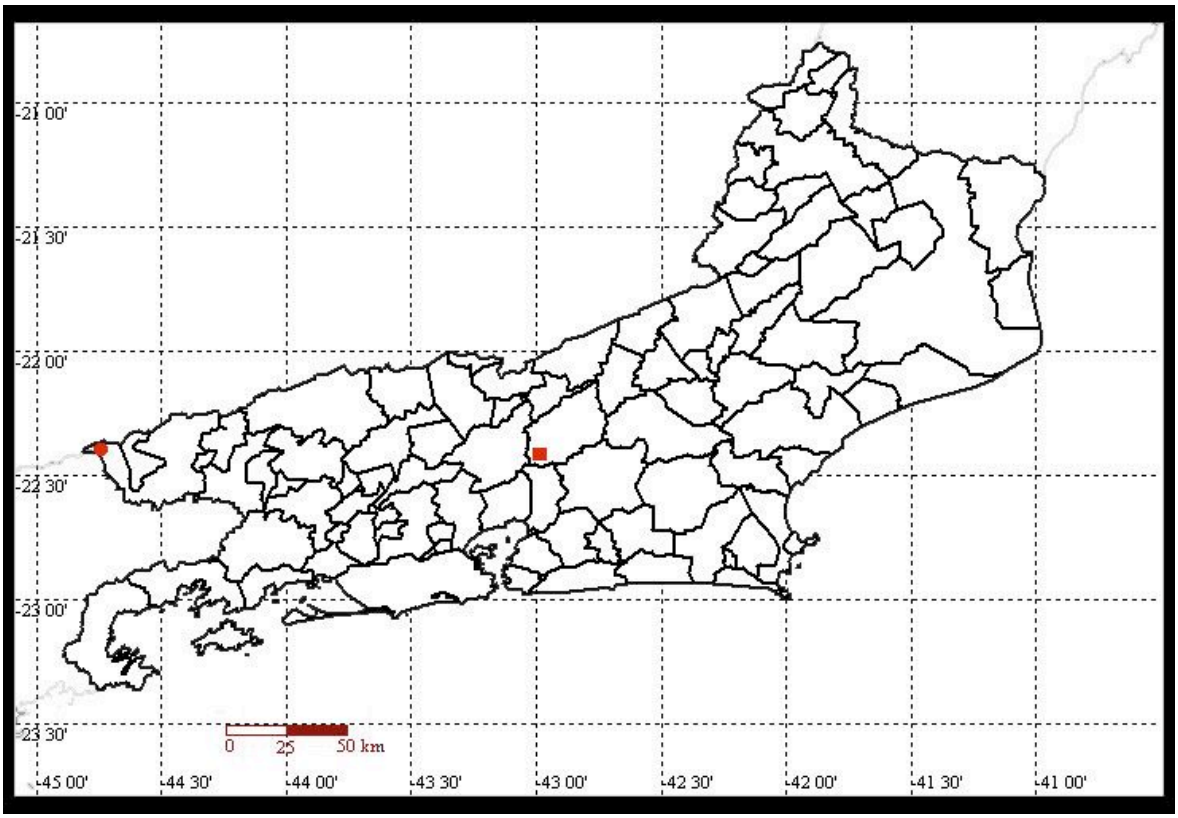


**Figure 4** – Areas of occurrence of *Antidaphne glaziovii* (●) and *Eubrachion ambiguum* (■) in the State of Rio De Janeiro.

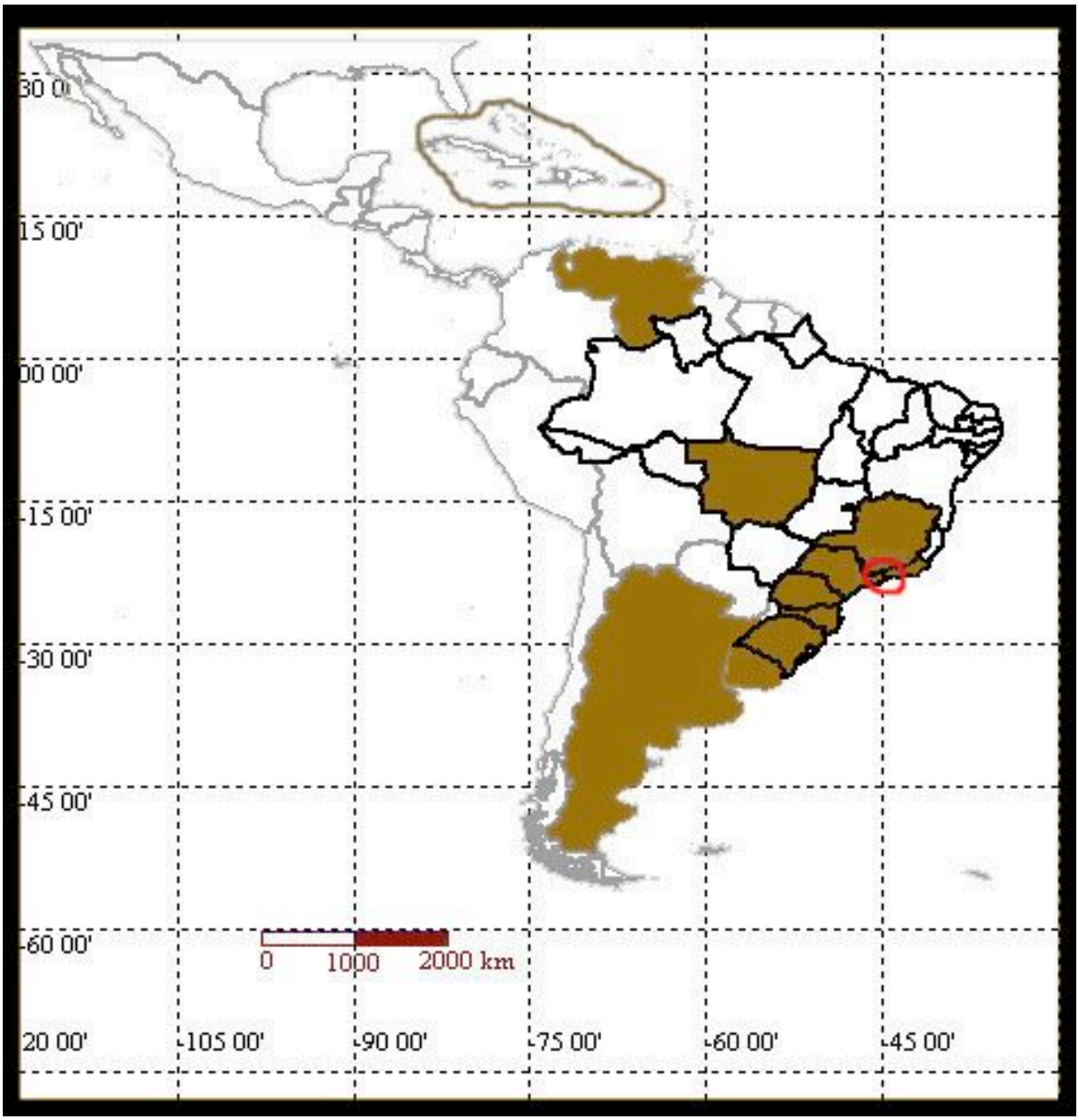


**Figure 5-**Geographical distribution of *Antidaphne glaziovii* (•) and *Eubrachion ambiguum* (•).

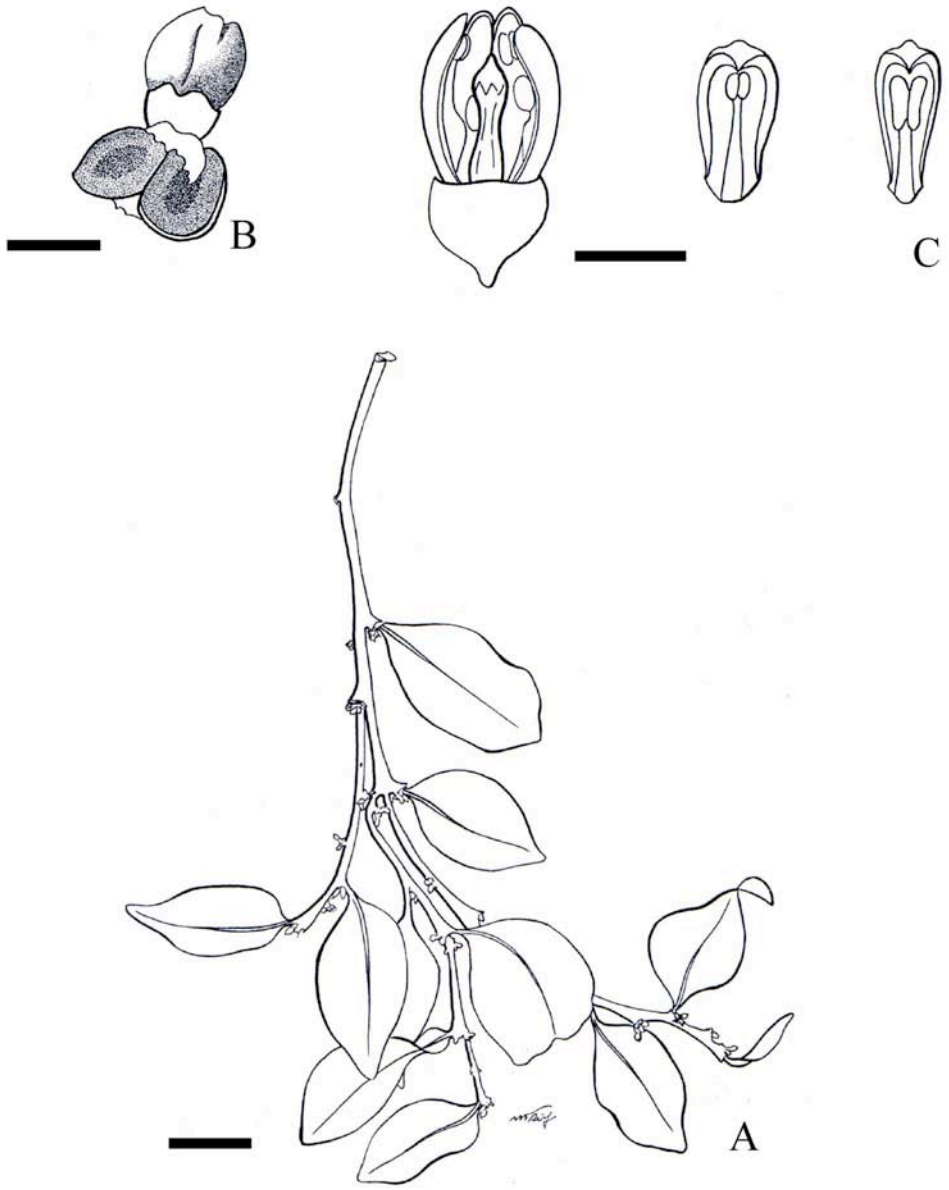


**Figure 6 -** ***Cladocolea alternifolia*** **(Eichl.) Kuijt**: A – flowering branch; B - detail of triad with two flowers missing and a closed bud (bar = 1 mm); C - dissected flower to the left and the two forms of tepals with epitepalous stamens to the right (bar = 0.5 mm). (*C.H.R. de Paula 364*).


**Figure 7 - *Cladocolea alternifolia* (Eichl.) Kuijt**: A – habit of individual (➥) on *Angostura sp.*(bar = 3cm); B- flowering branch (bar = 5 cm); C- detail of insertion on host (bar = 3 cm); D- detail of leaf showing translucent dots (bar = 1.5 cm); E- detail of the flowers (bar = 3 mm).

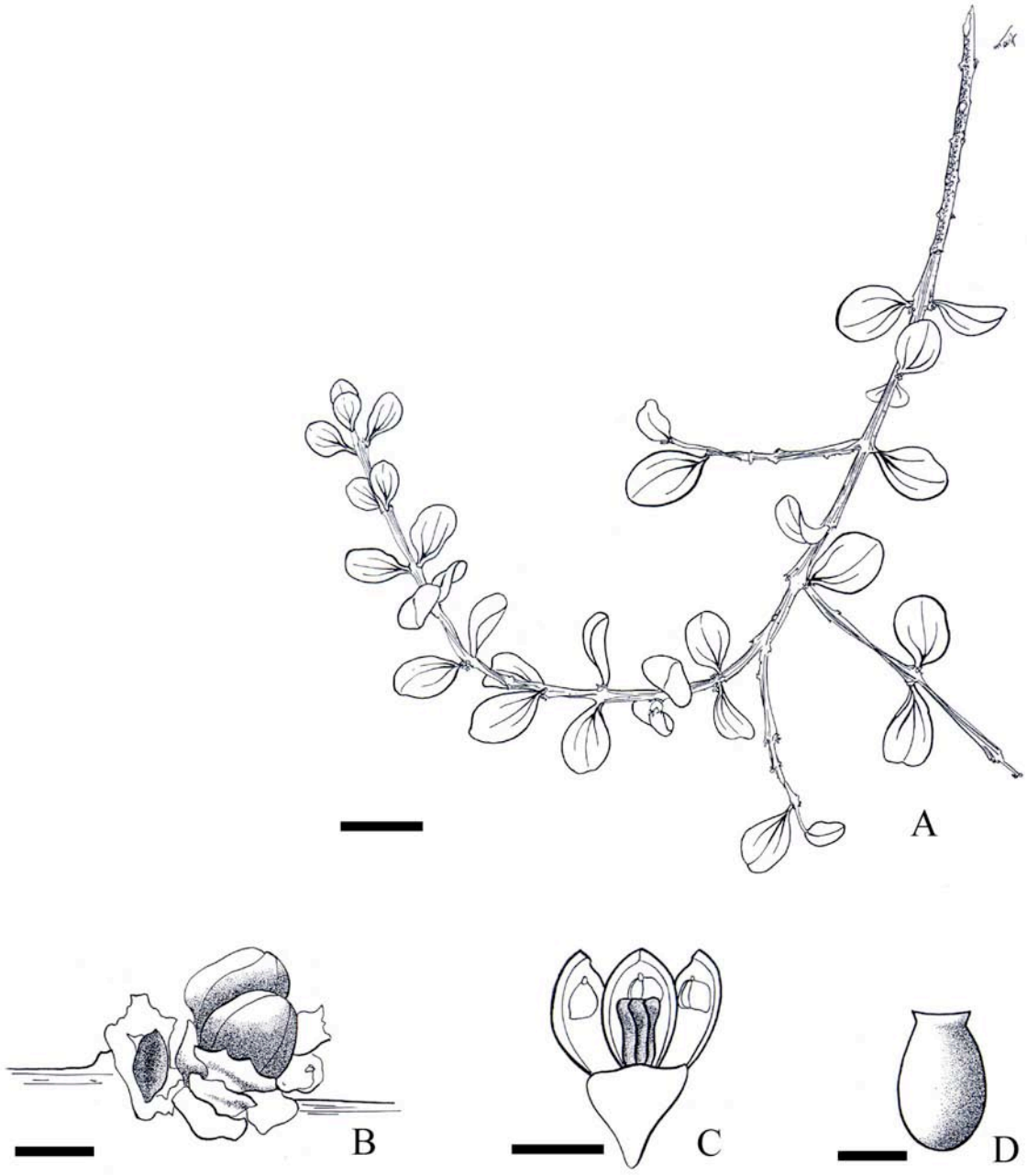


**Figure 8 -** ***Ixocactus clandestinus*** **(Mart.) Kuijt**: A – flowering and fruiting branch (bar = 2 cm); B – detail of the glomerule with a missing bud to the left (bar = 0.5 mm); C – dissected flower (bar = 0.5 mm); D – fruit in lateral view (bar = 0.5 mm). (*C.H.R. de Paula and S.J.S. Neto 131*).

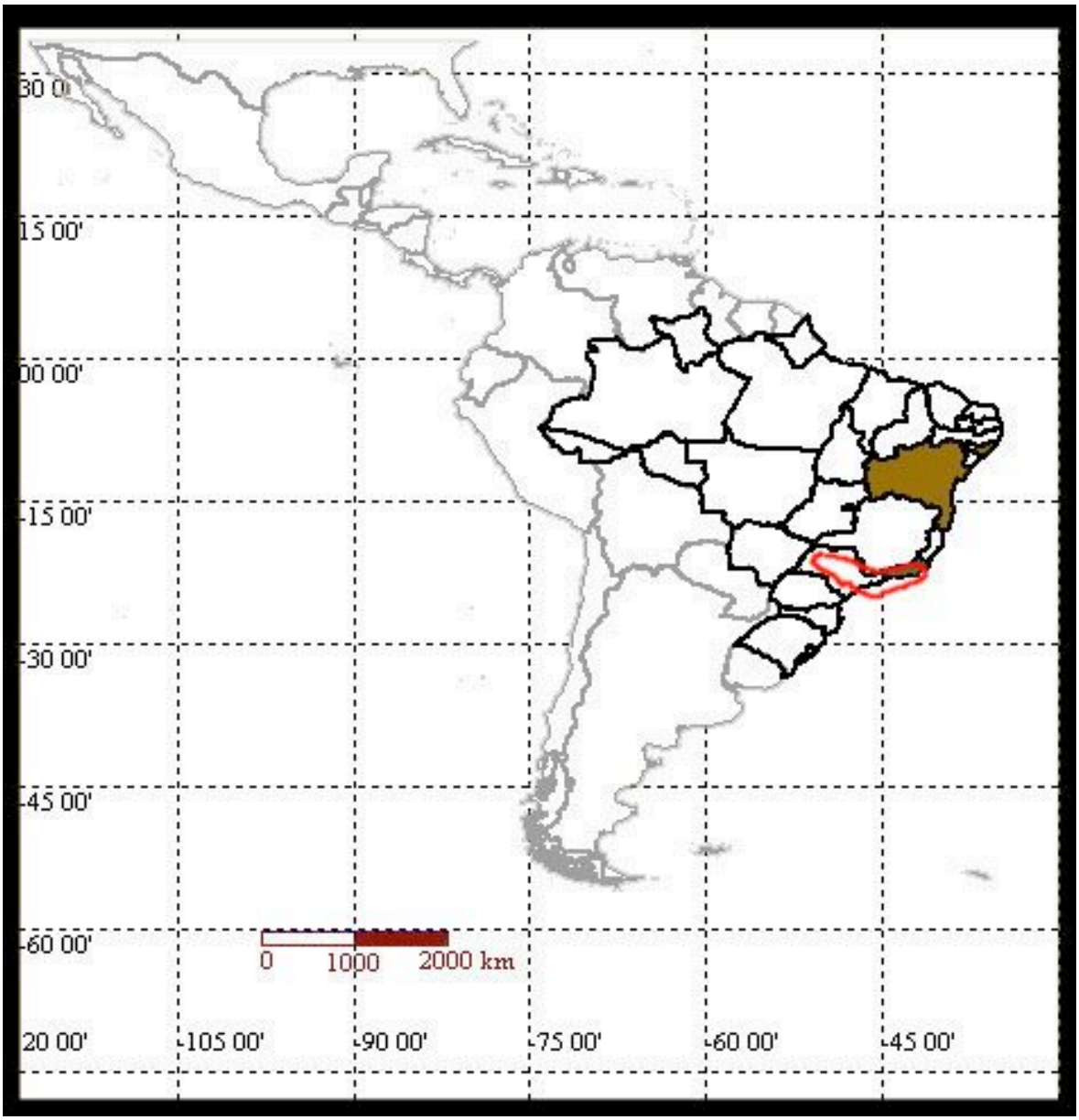


**Figure 9 -** Geographical distribution of *Cladocolea alternifolia* (•) and *Ixocactus clandestinus* (•)

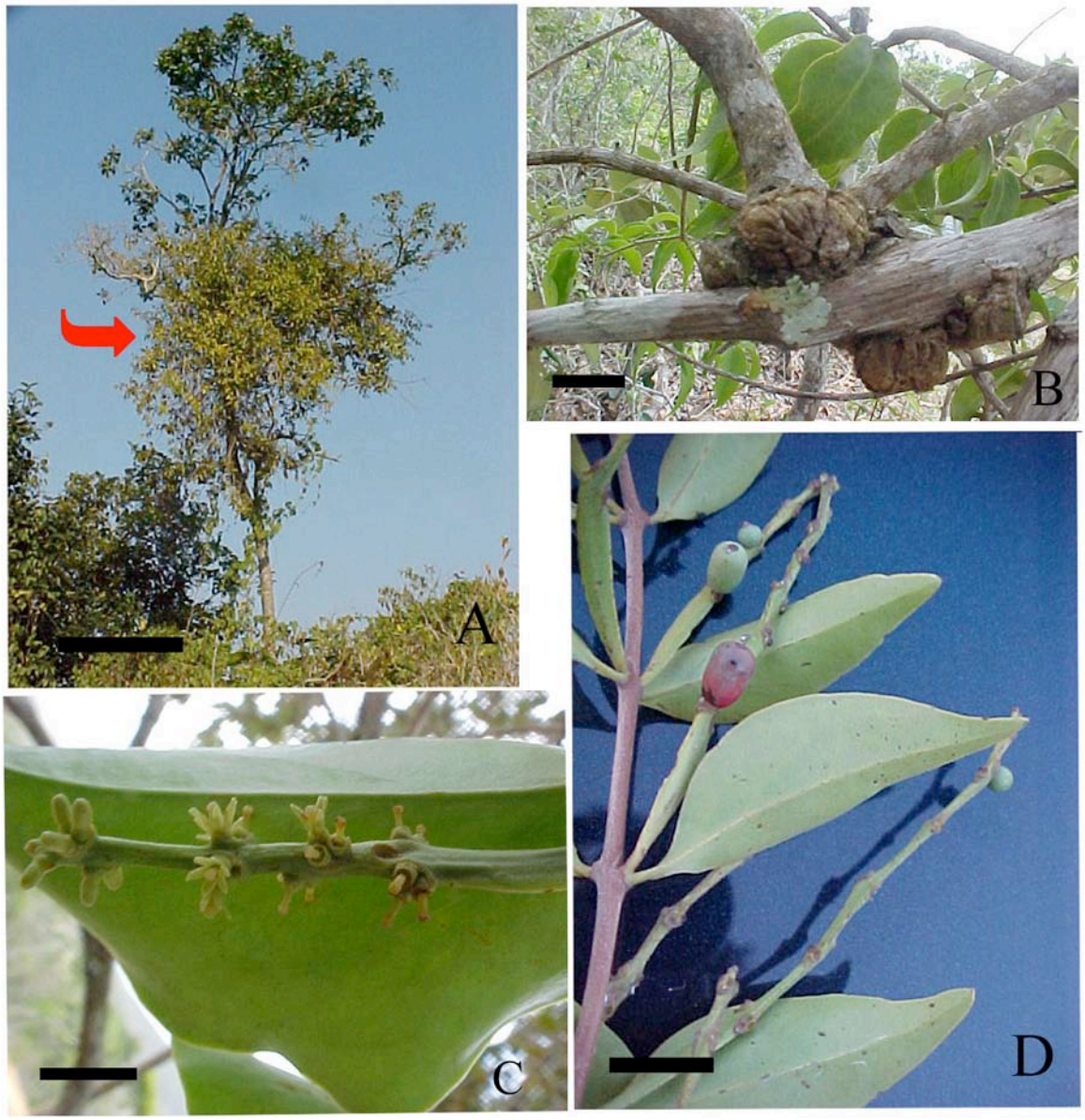


**Figure 10 - *Phthirusa podoptera* (Cham. *et* Schlecht.) Kuijt**: A- general aspect of the individual (↪) (bar = 1 m); B – detail of insertion on the host (bar = 2 cm); C – detail of the female inflorescence (bar = 1 cm); D – detail of the inflorescence (bar = 1 cm).

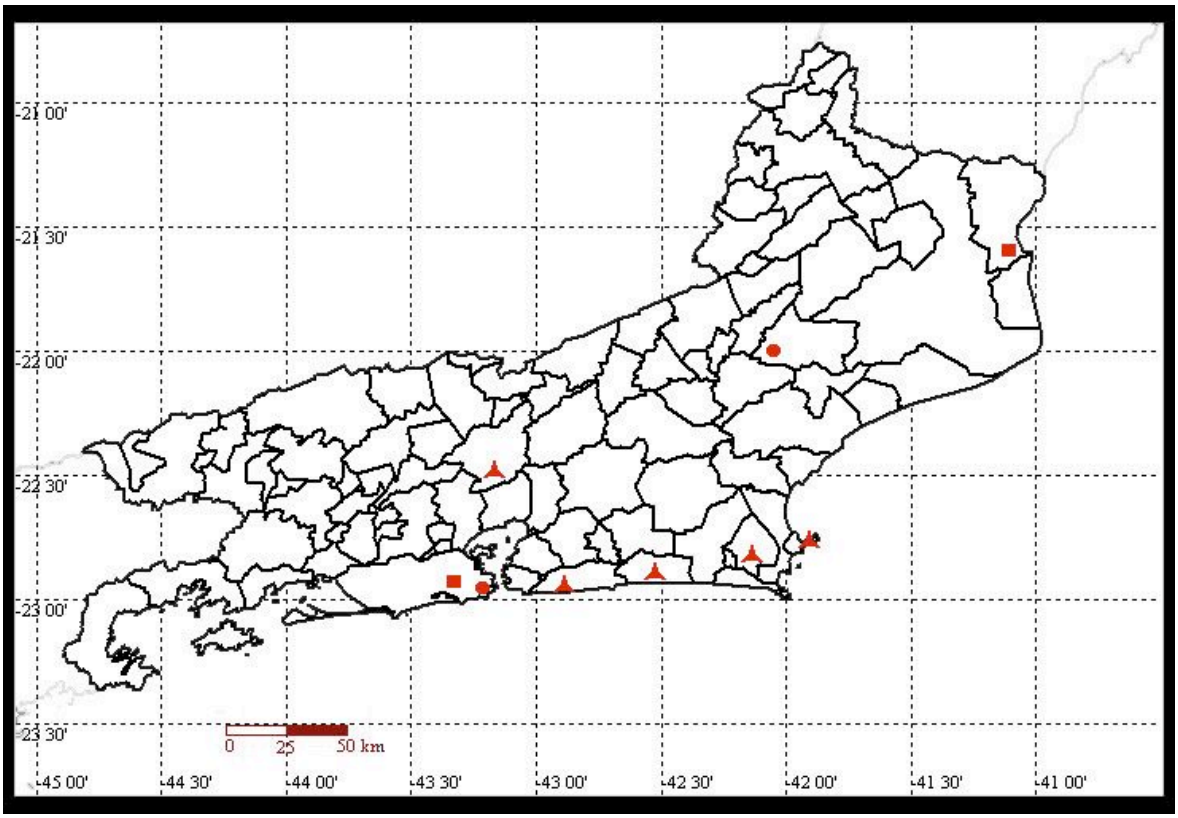


**Figure 11 -** Areas of occurrence of *Cladocolea alternifolia* (●), *Ixocactus clandestinus* (■) and *Phthirusa podoptera* (▲) in the state of Rio de Janeiro.


**Figure 12 -*Phthirusa pyrifolia* (H.B.K.) Eichl.:** A- flowering branch (bar = 3 cm); B – detail of the spike without flowers, showing the bracteolar cupule (bar = 1 mm); C – detail of a dissected flower to the left and isolated tepals to the right (bar = 1 mm) (*C.H.R.dePaula 357*).

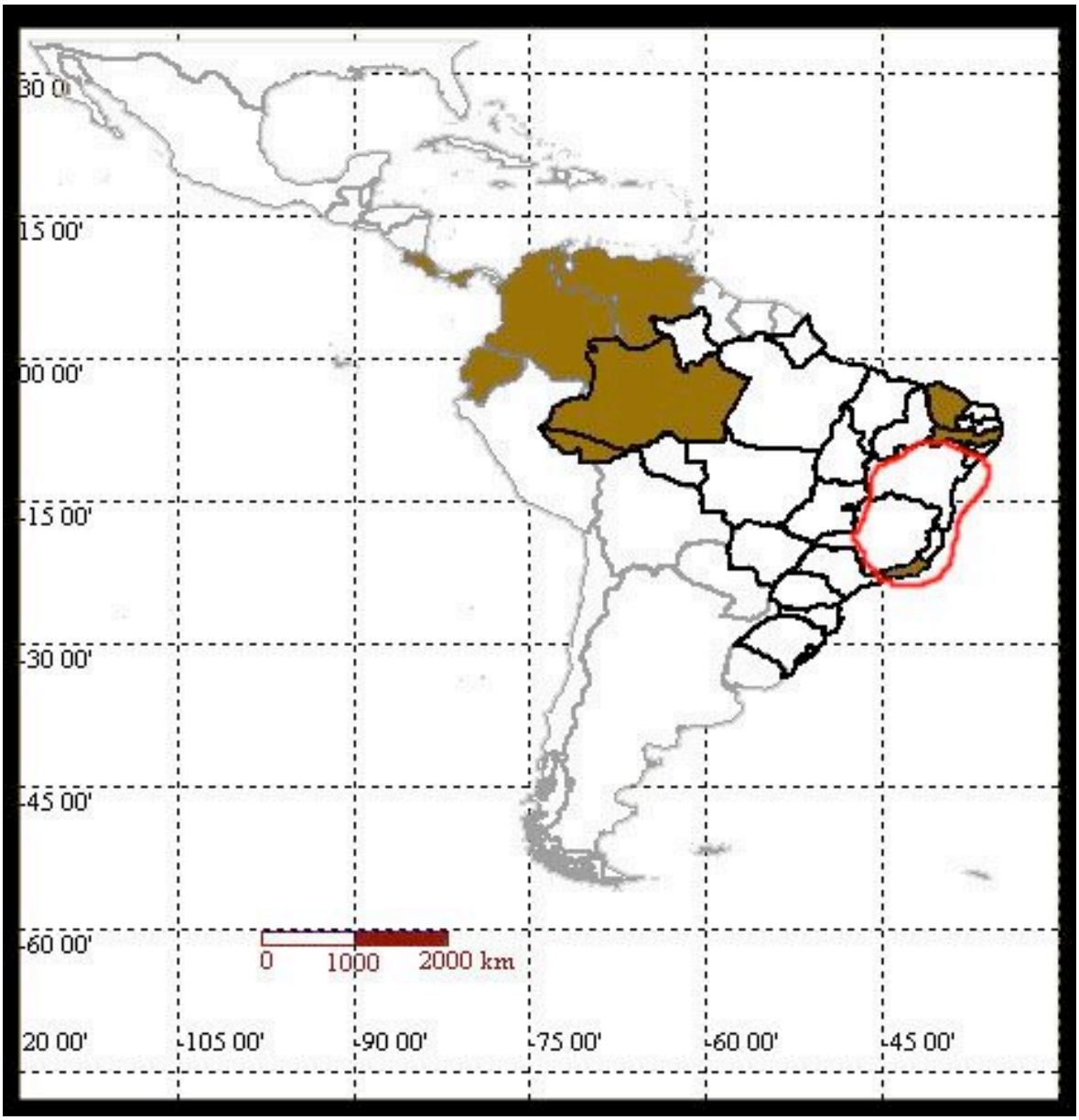


**Figure 13 -** Geographical distribution of *Phthirusa podoptera* (•) and *P. pyrifolia* (•).

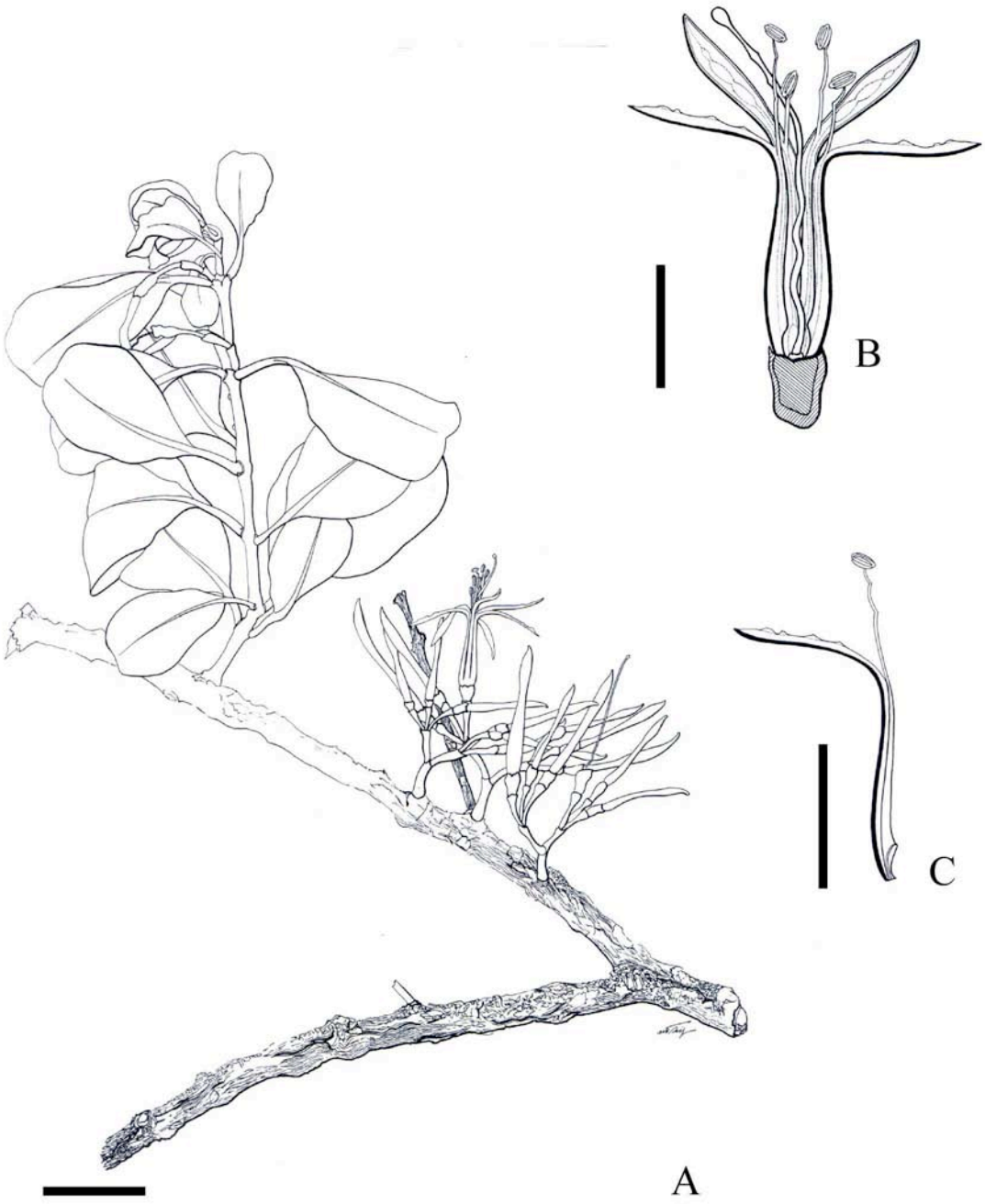


**Figure 14 -** ***Psittacanthus dichrous*** **Mart**.: A- flowering branch (bar = 3cm); B- dissected flower (bar = 2 cm); C- isolated tepal (bar = 1 cm). (*C.H.R.dePaula and A. Rayol 474*).

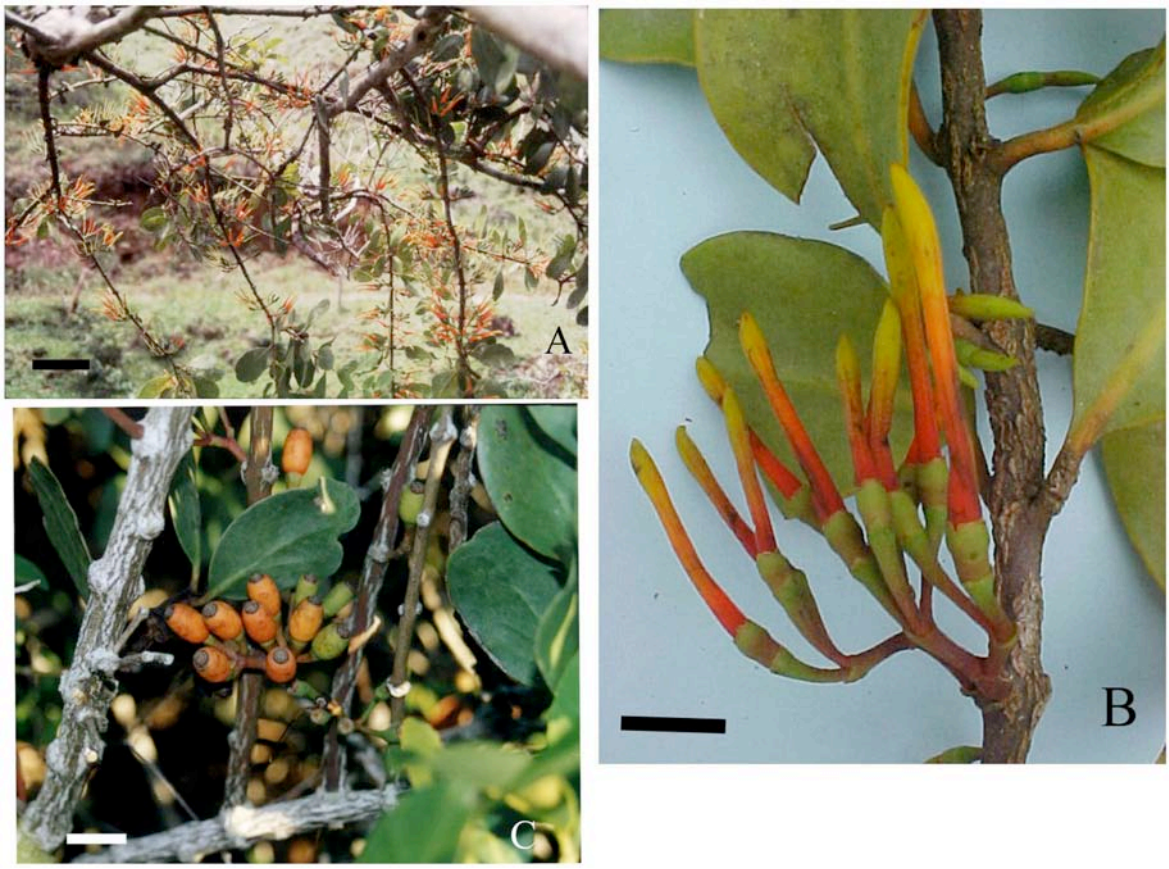


**Figure 15 - *Psittacanthus dichrous* Mart**.: A – general aspect of an individual (bar = 5 cm); B – detail of the inflorescence (bar = 2 cm); C - fruits (bar = 1.5 cm).

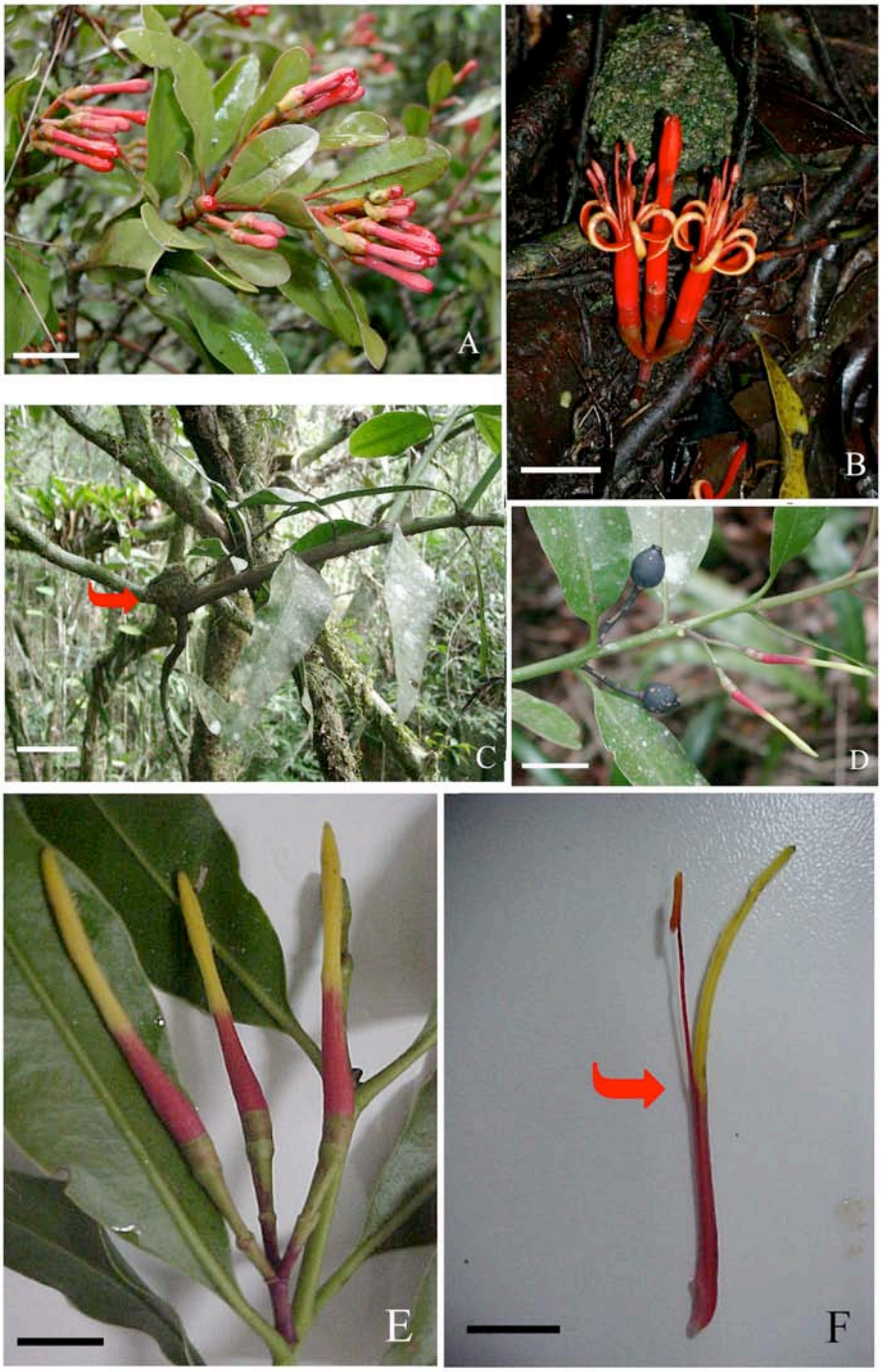


**Figure 16 -** ***Psittacanthus flavo-viridis*** **Eichl.**: A – aspect of the flowering branch (bar = 5 cm); B – detail of the triad (bar = 2 cm). ***Psittacanthus pluricotyledonarius*** **Rizz.:** C – detail of insertion (↪) on host (bar = 2 cm); D – detail of flowers and fruits (bar = 2.5 cm); E – detail of the inflorescence with triads (bar = 1 cm); F – isolated tepals showing (↪) point of attachment of the filament (bar = 1 cm).

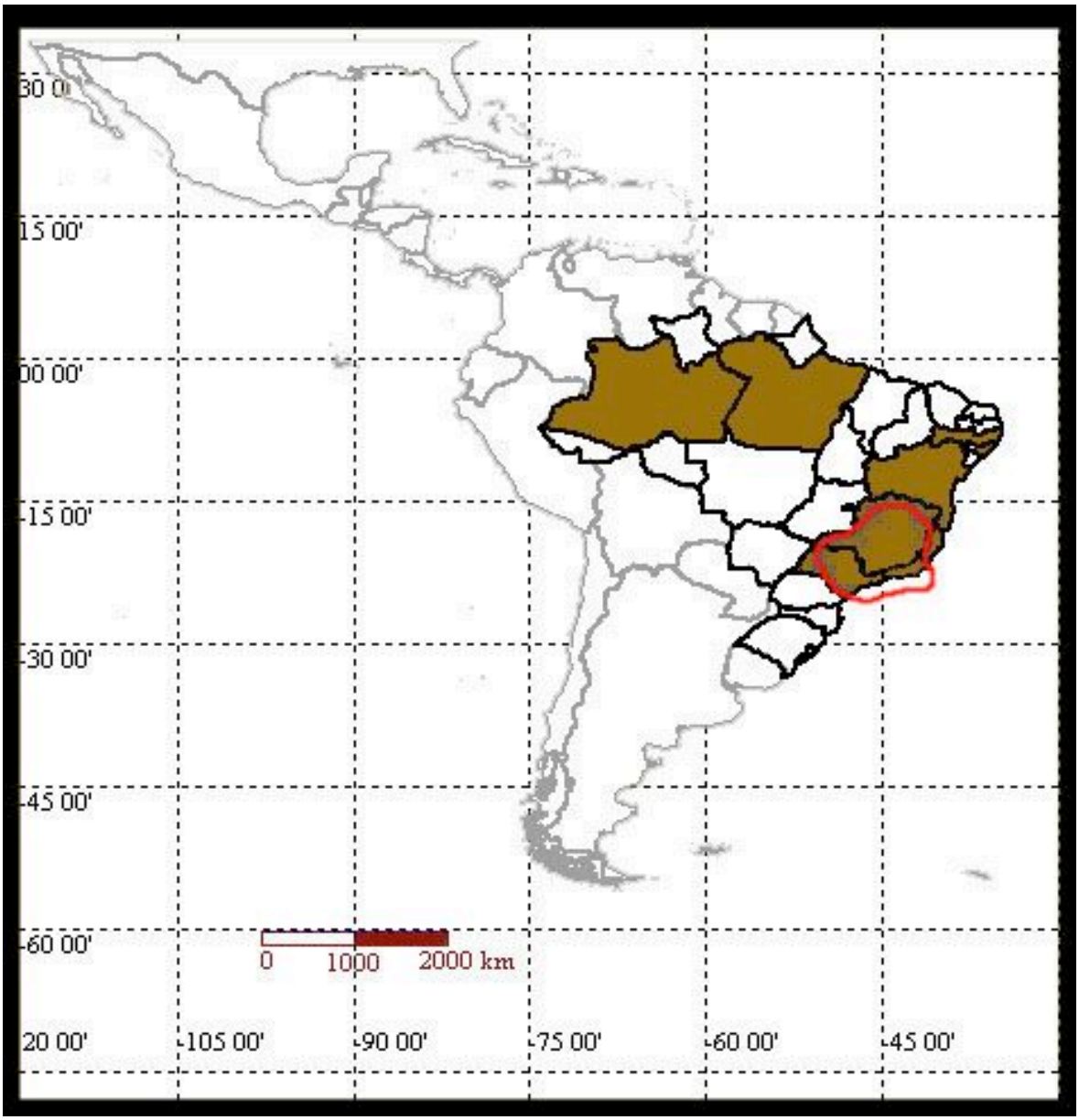


**Figure 17 -** Geographical distribution of *Psittacanthus dichrous* (•) and *P. flavo-viridis* (•).

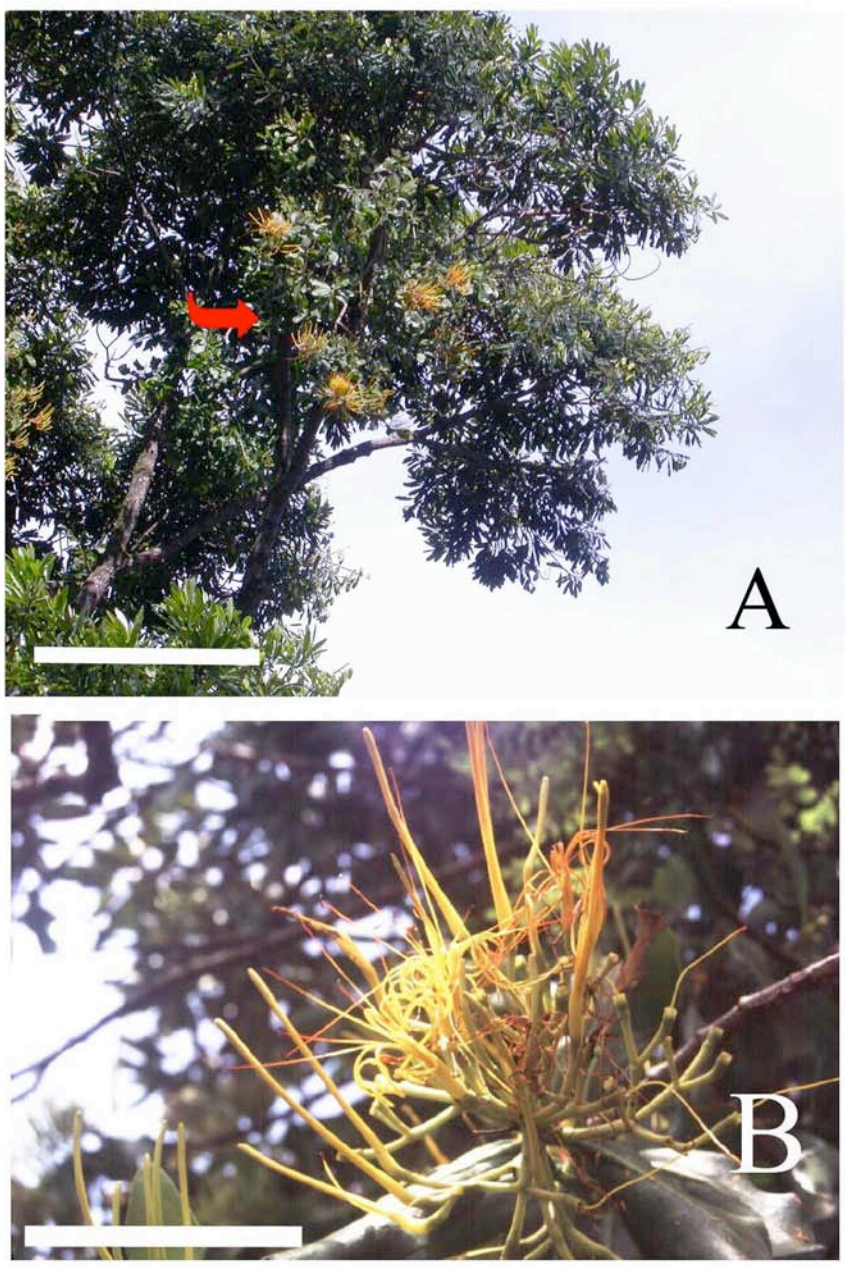


**Figure 18 -** ***Psittacanthus robustus*** **Mart**.: A - individual (↪) on *Vochysia oppugnata* (Vell.) Warn. (bar = 2 m); B – detail of the inflorescence (bar = 10 cm).

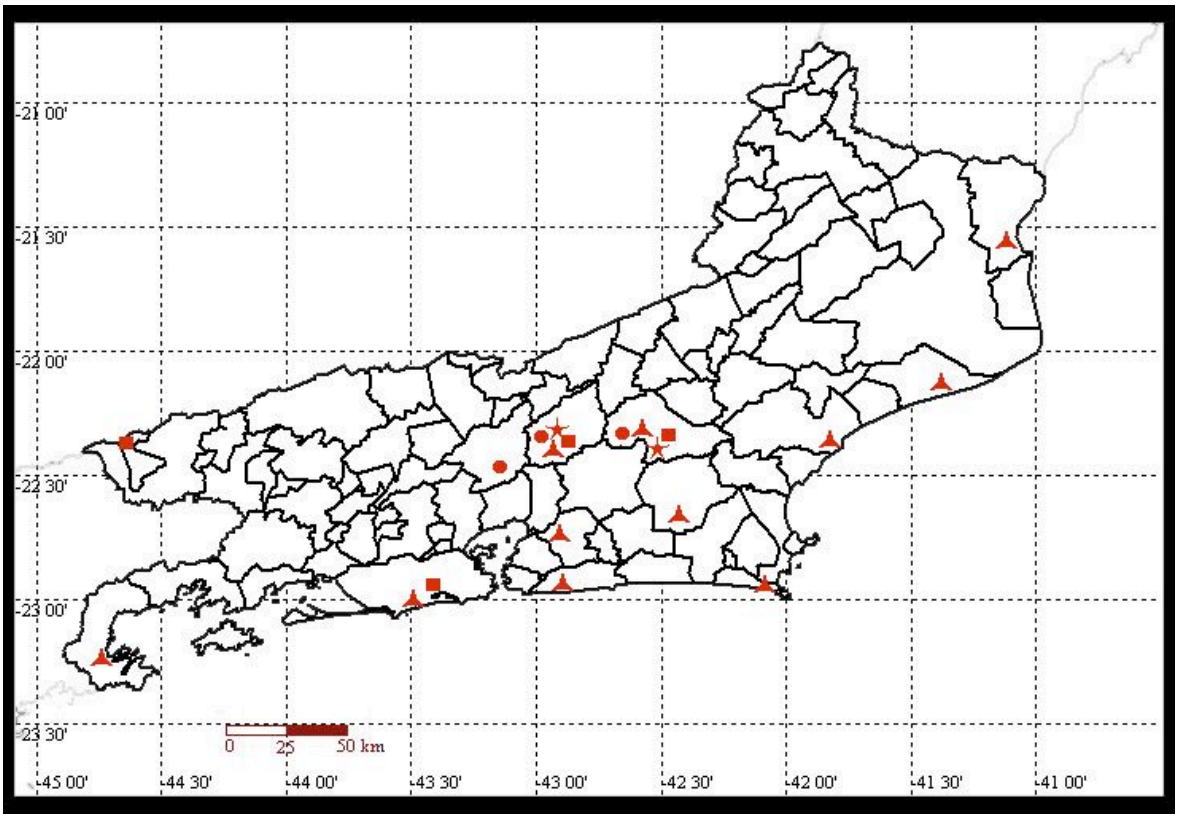


**Figure 19 -** Areas of occurrence of *Psittacanthus dichrous* (▲), *P. flavo-viridis* (■), *P. pluricotyledonarius* (●) and *P. robustus* (★) in the state of Rio de Janeiro.

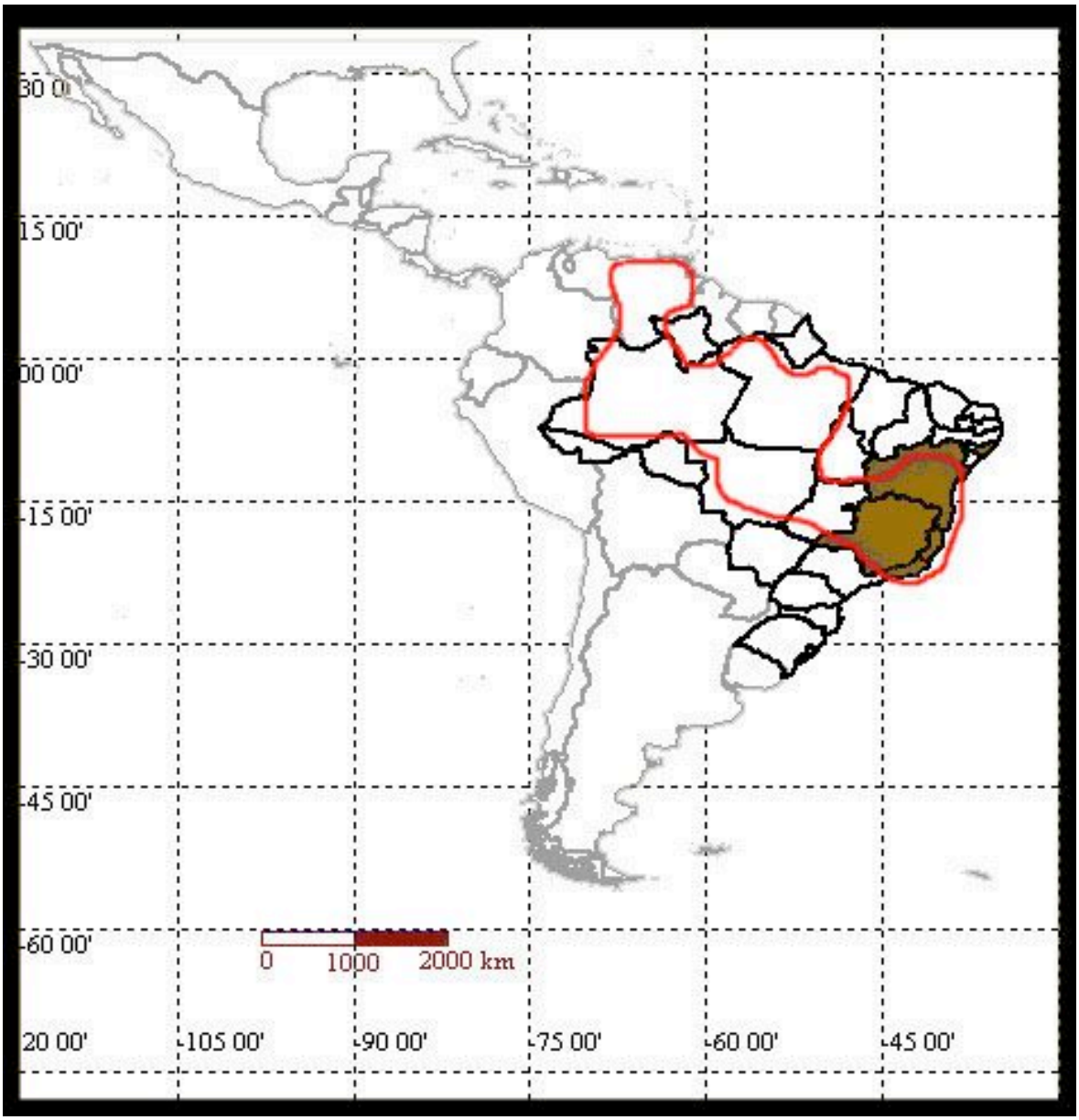


**Figure 20 -** Geographical distribution of *Psittacanthus furcatus* (•) and *P. robustus* (•).

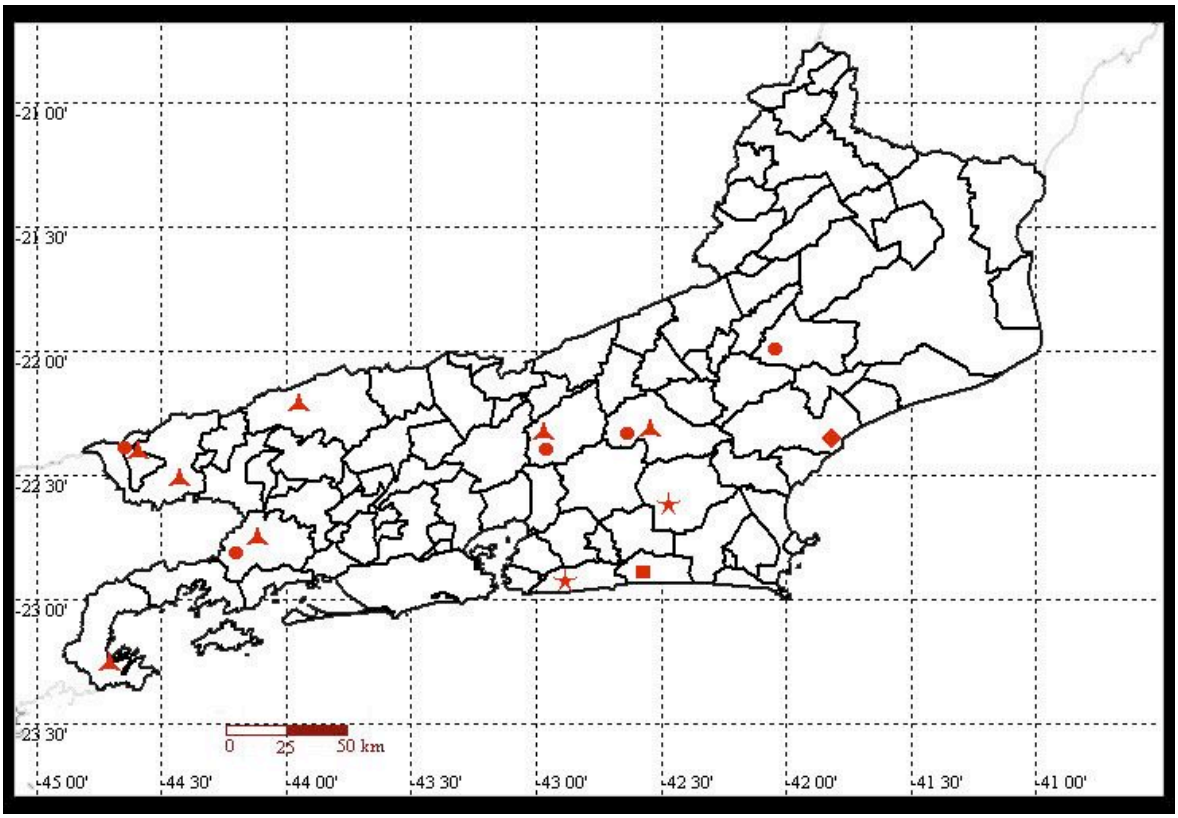


**Figure 21 -** Areas of occurrence *Struthanthus andrastylus* (●), *S. armandianus* (■), *S. concinnus* (▲), *S. confertus* (★) and *S. dorothyi* (◆) in the state of Rio de Janeiro**.**

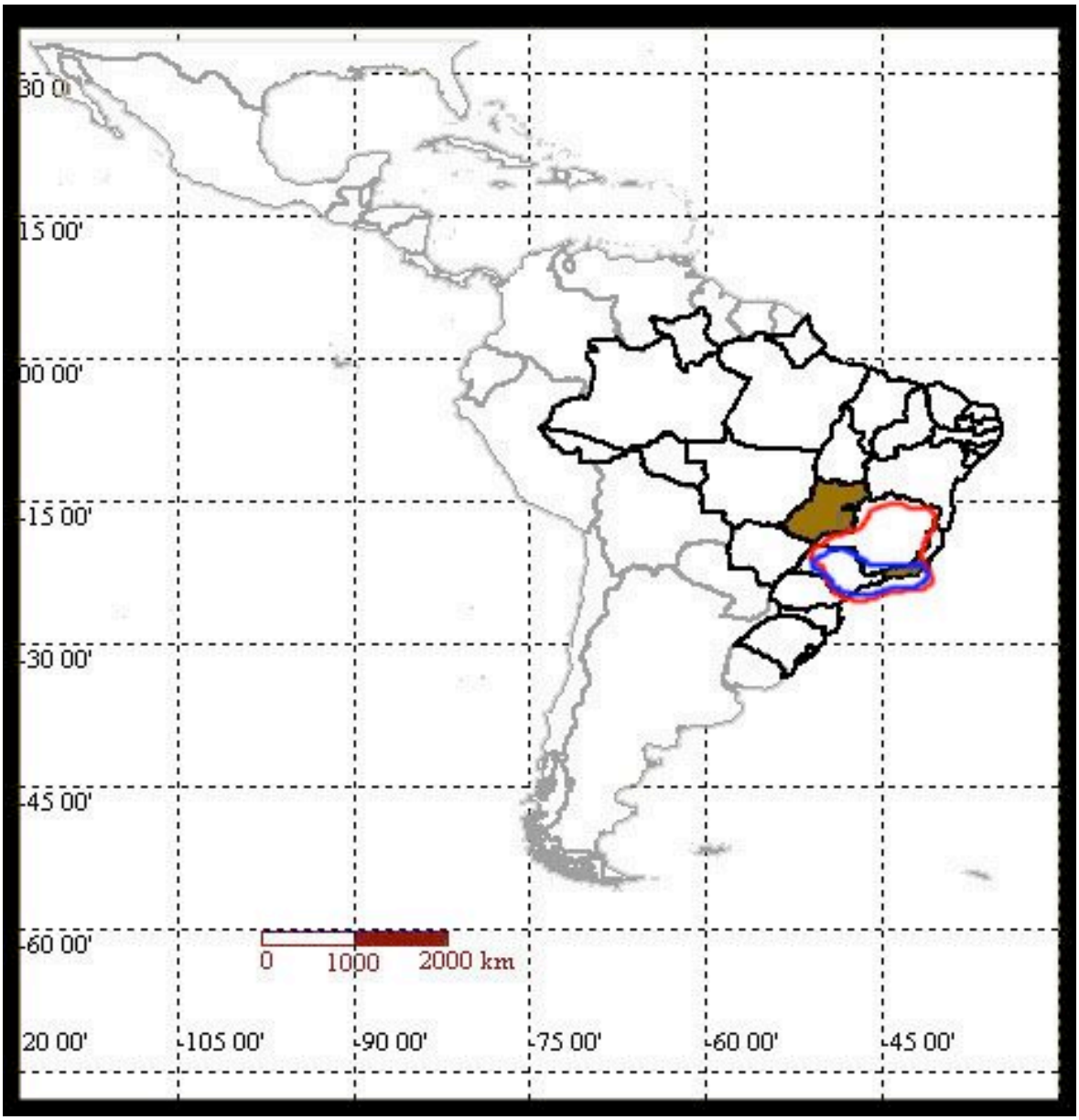


**Figure 22-** Geographical distribution of *Struthanthus andrastylus* (•), *S. concinnus* (•) and *S. confertus* (•).

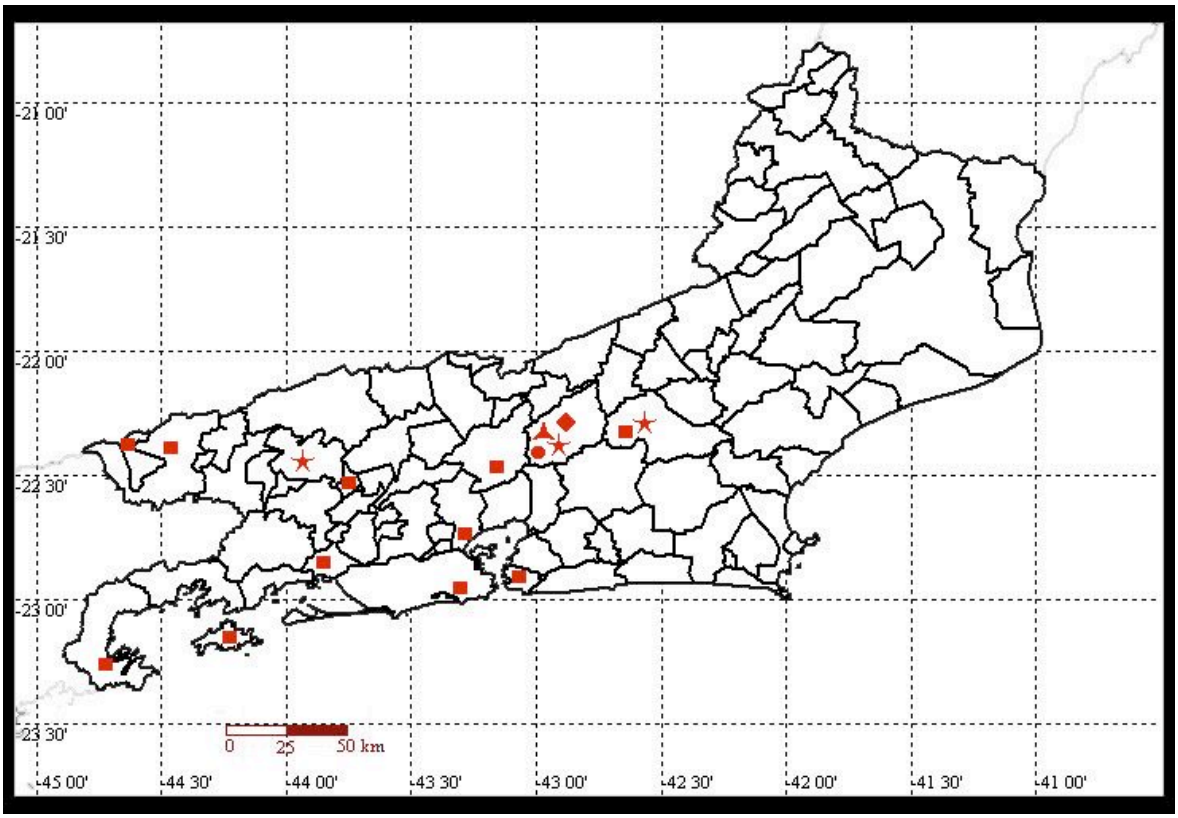


**Figure 23** - Areas of occurrence of *Struthanthus glomeriflorus* (●), *S. marginatus* var. *marginatus* (■), *S. marginatus* var. *friburgensis* (★), *S. marginatus* var. *oval-lanceolatus* (▲) and *S. marginatus* var. *paniculatus* (◆)in the state of Rio de Janeiro.

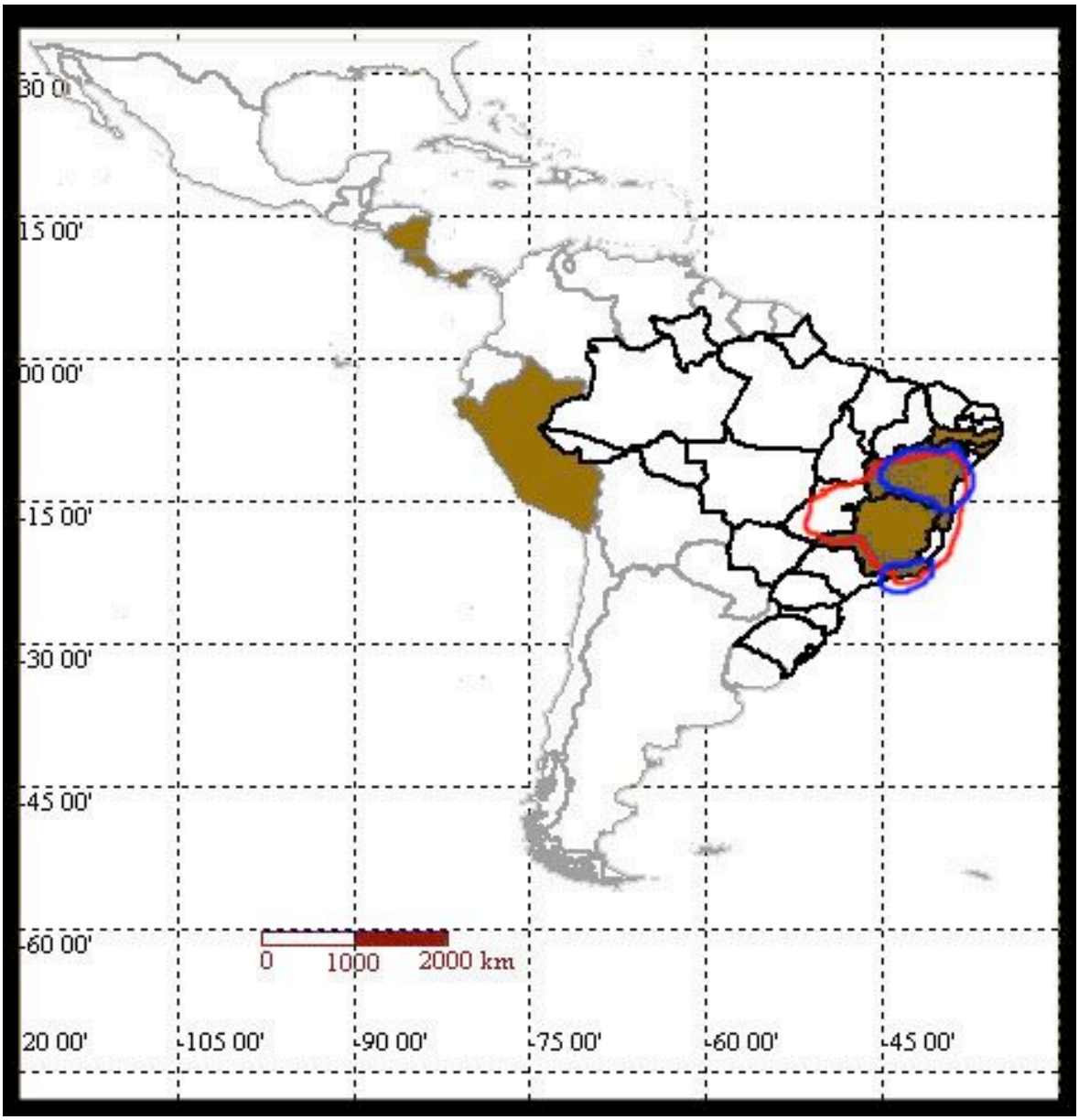


**Figure 24 -** Geographical distribution of *Struthanthus flexicaulis* (•), *S. glomeriflorus* (•) and *S. marginatus* var. *marginatus* (•).

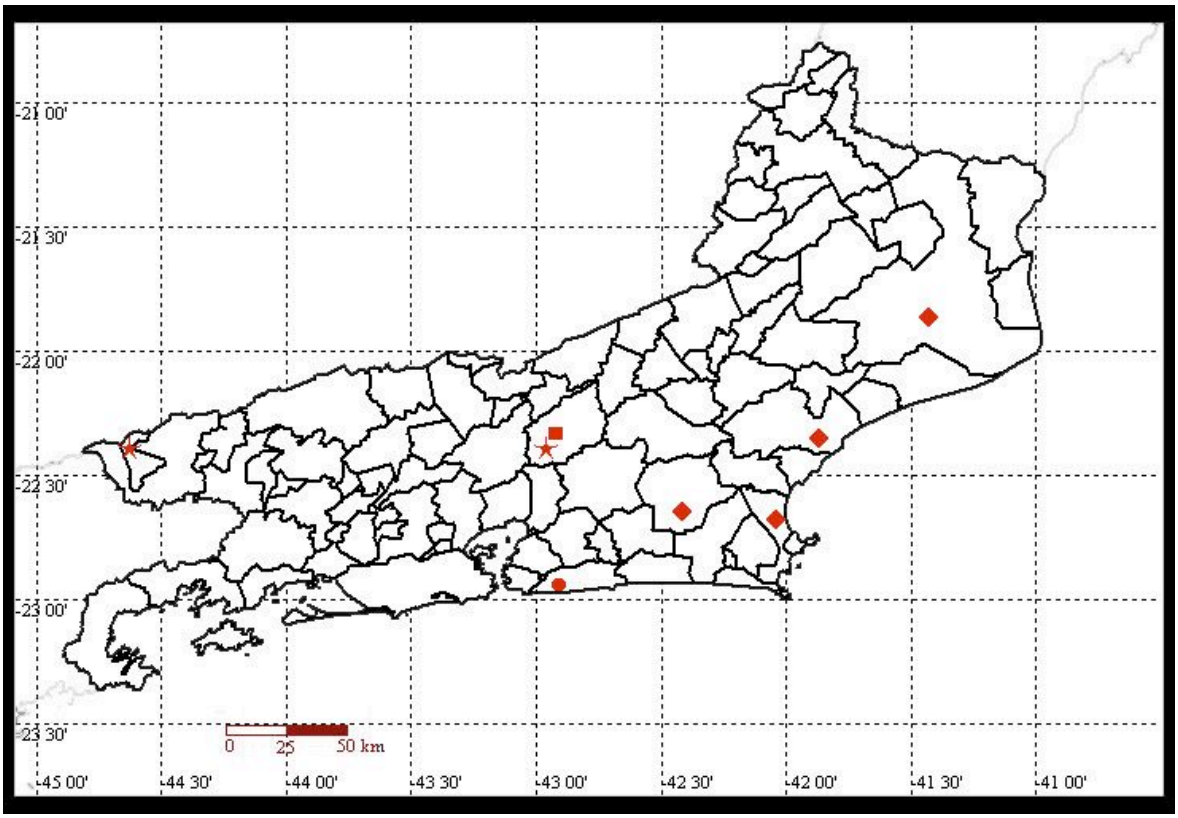


**Figure 25 -** Areas of occurrence of *Struthanthus maricensis* (●), *S. pentamerus* (★), *S. polyrhizus* var. *oblongifolius* (■) and *S. rhynchophyllus* (◆) in the state of Rio de Janeiro.

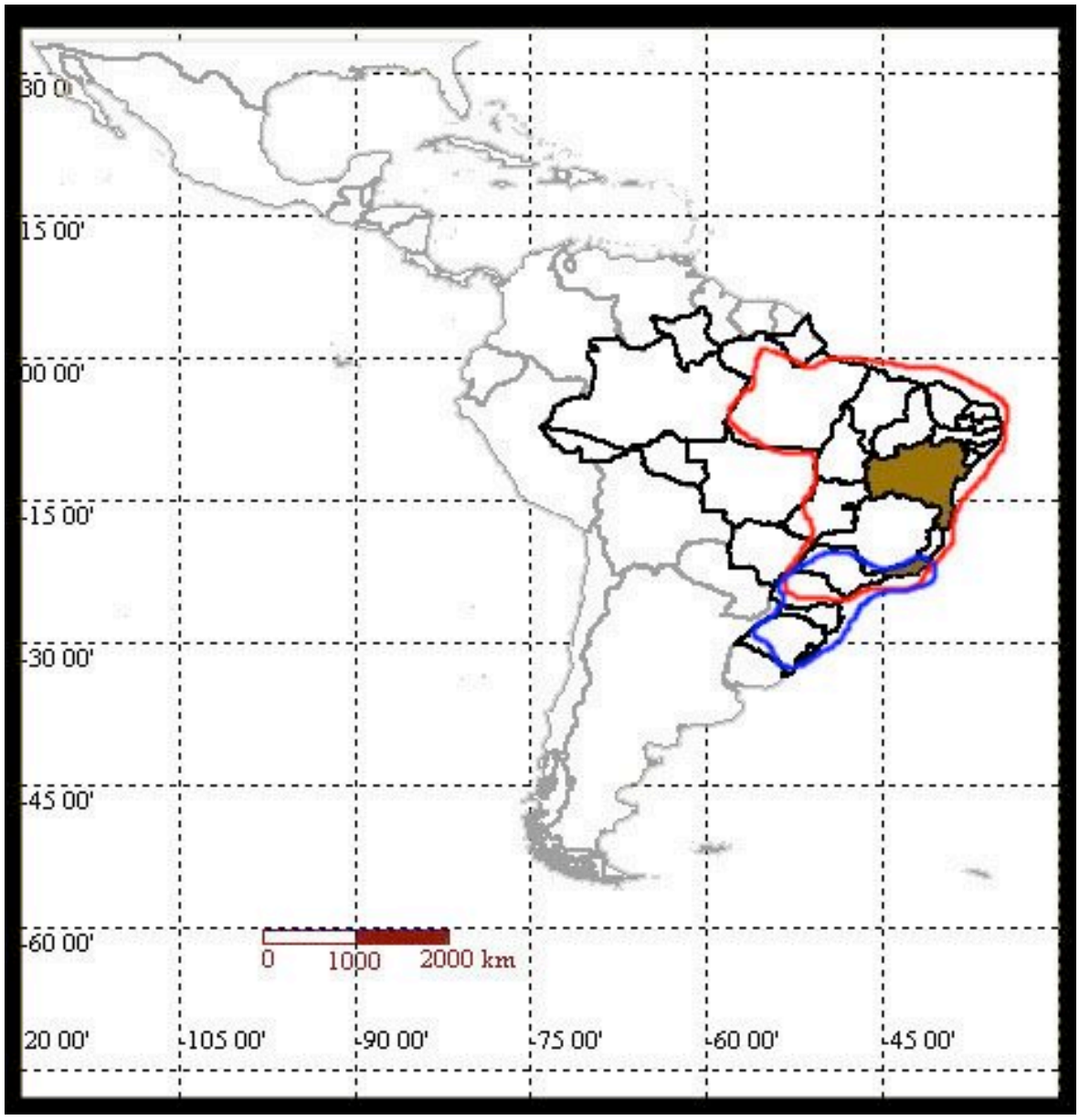


**Figure 26 -** Geographical distribution of *Struthanthus polyrhizus* var. *polyrhizus* (•), *S. polyrhizus* var. *oblongifolius* (•) and *S. rhynchophyllus* (•).

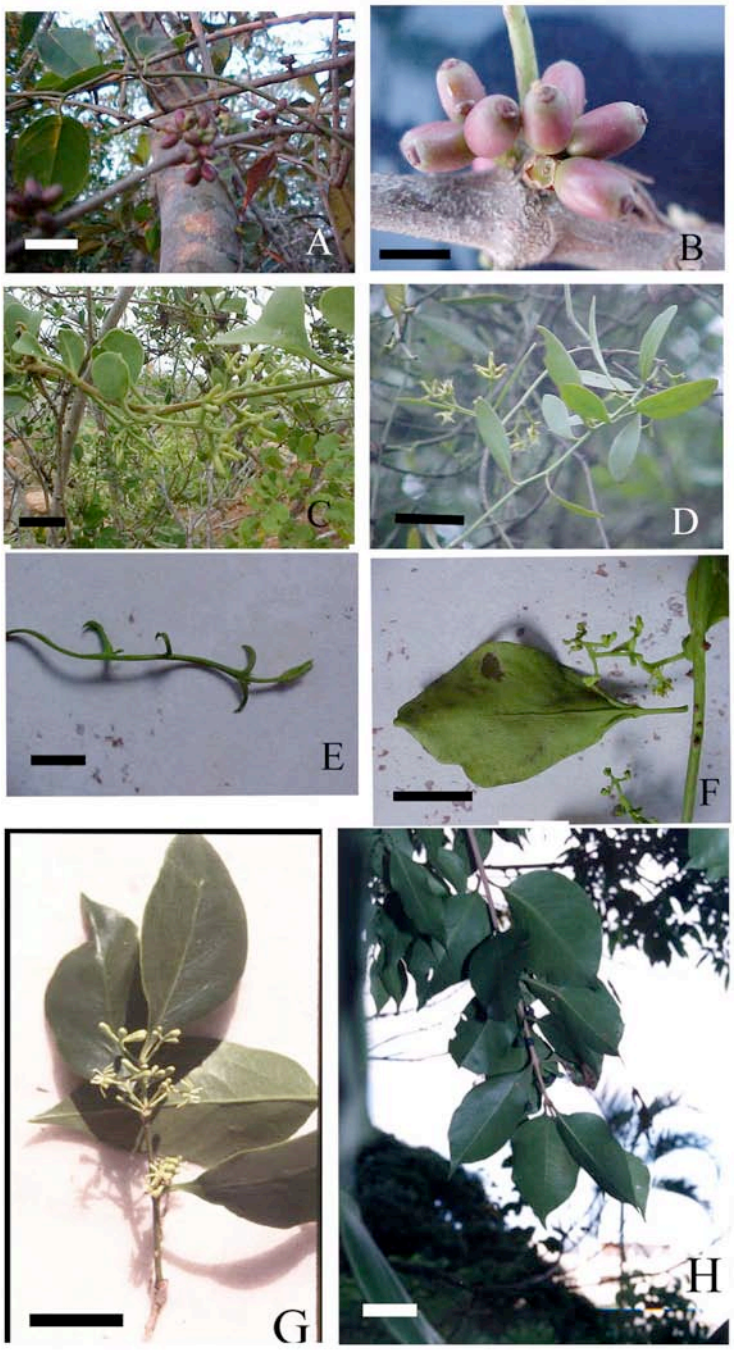


**Figure 27 - *Struthanthus maricensis* Rizz.:** A – aspect of the fruiting branch (bar = 2 cm); B – detail of the infructescence (bar = 1 cm). ***Struthanthus polyrhizus* Mart. var. *polyrhizus***: C – aspect of a flowering branch (bar = 1 cm**). *Struthanthus uraguensis* (Hook *et* Arn.)G.Don.**: D - aspect of a flowering branch (bar = 3 cm). ***Struthanthus staphylinus* Mart. var. *staphylinus***: E – detail of the young "hamato-curvadas" leaves (bar = 1.0 cm); F – detail of the adult leaves with auriculate base and inflorescence (bar = 1,5 cm). ***Struthanthus vulgaris* Mart.**: G – branch with female flowers (bar = 2.5 cm); H – branch with immature fruits (bar = 3 cm).

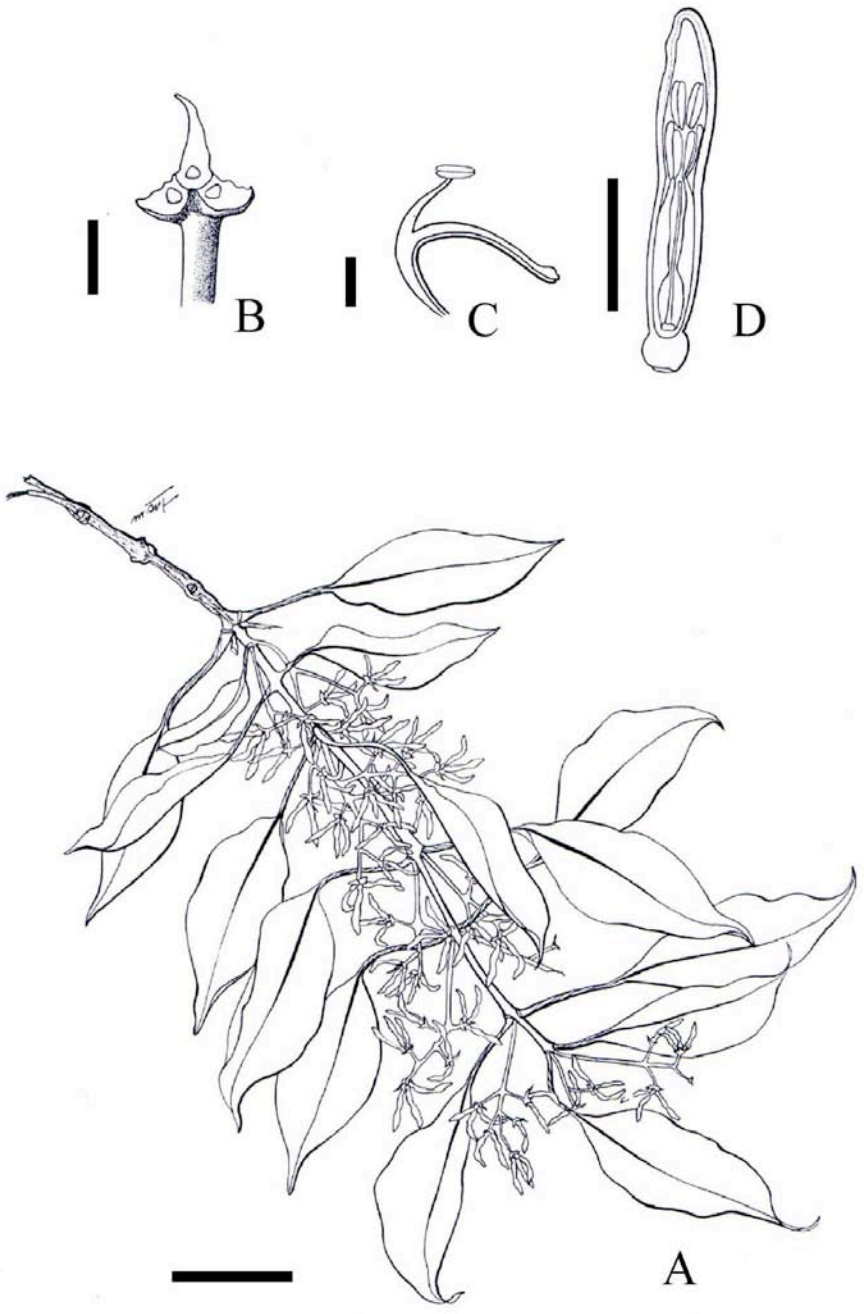


**Figure 28 -** ***Struthanthus syringifolius*** **Mart**.: A- flowering branch of a male plant (bar = 3 cm); B- bracteolar cupule (bar = 0.5 mm); C- isolated tepals (bar = 0.3 mm); D- male bud in longitudinal section (bar = 0.5 mm). (*C.H.R. de Paula 516*).

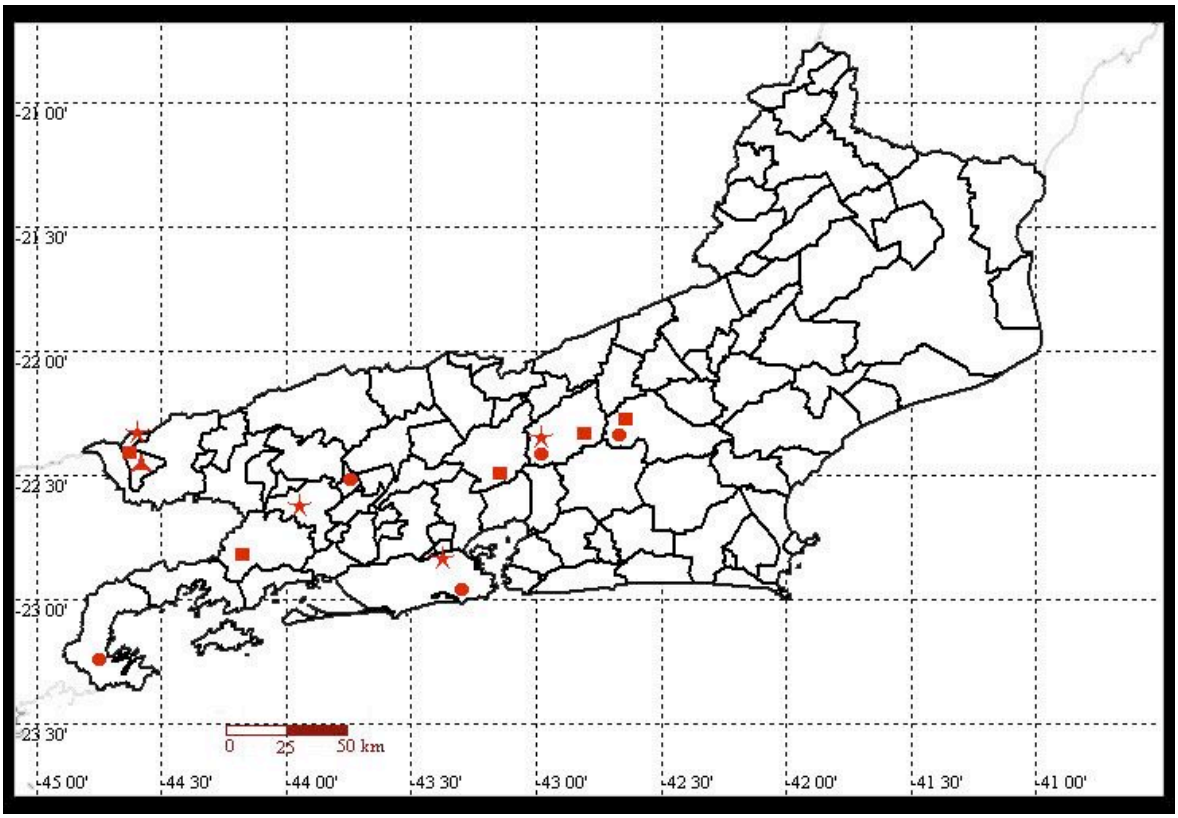


**Figure 29 -** Areas of occurrence of *Struthanthus salicifolius* (●), *S. staphylinus* var. *staphylinus* (■), *S. staphylinus* var. *palifolius* (▲) and *S. syringifolius* (★) in the state of Rio de Janeiro.

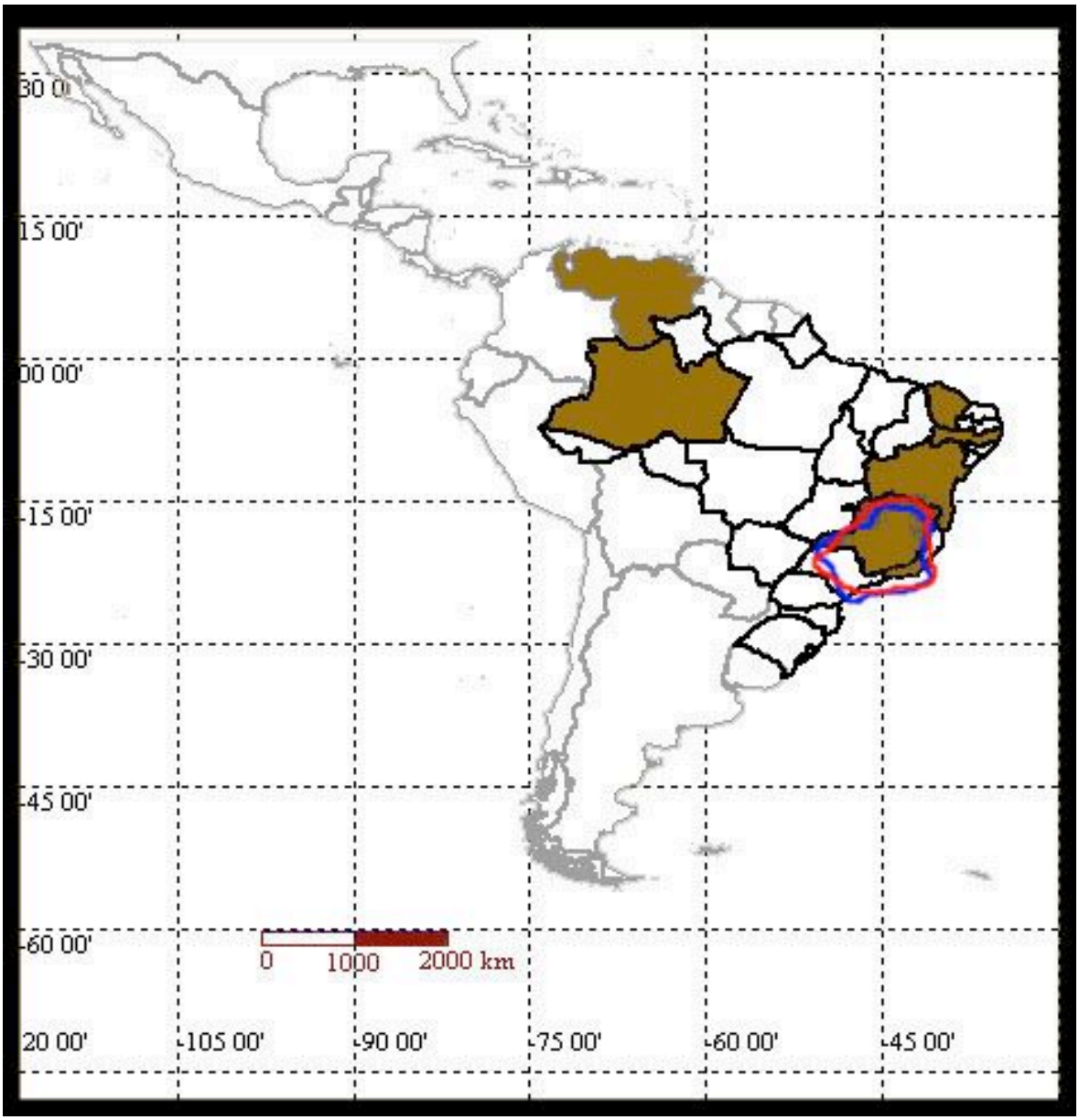


**Figura 30 –** Geographic distribution of *Struthanthus salicifolius* (•), *S. staphylinus* var. *staphylinus* (•) and *S. syringifolius* (•).

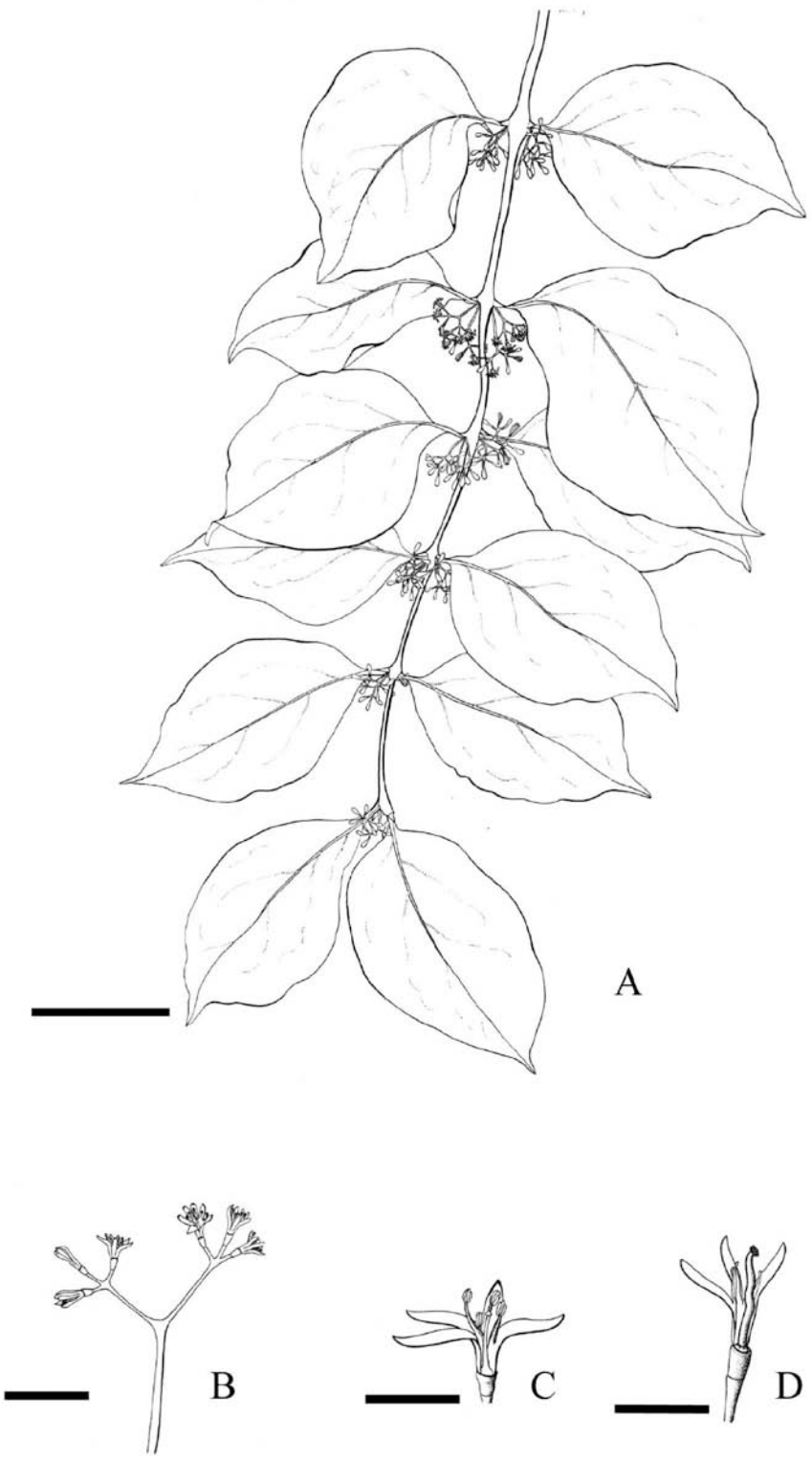


**Figure 31 -** ***Struthanthus vulgaris*** **Mart**.: A- flowering branch of a male plant (bar = 4cm); B – isolated male inflorescence (bar = 2 cm); C- male flower (bar = 1 cm); D- female flower (bar = 1 cm). (A, B, C: *C.H.R. de Paula and S.J.S. Neto 132*; D: *C.H.R. de Paula 530*)

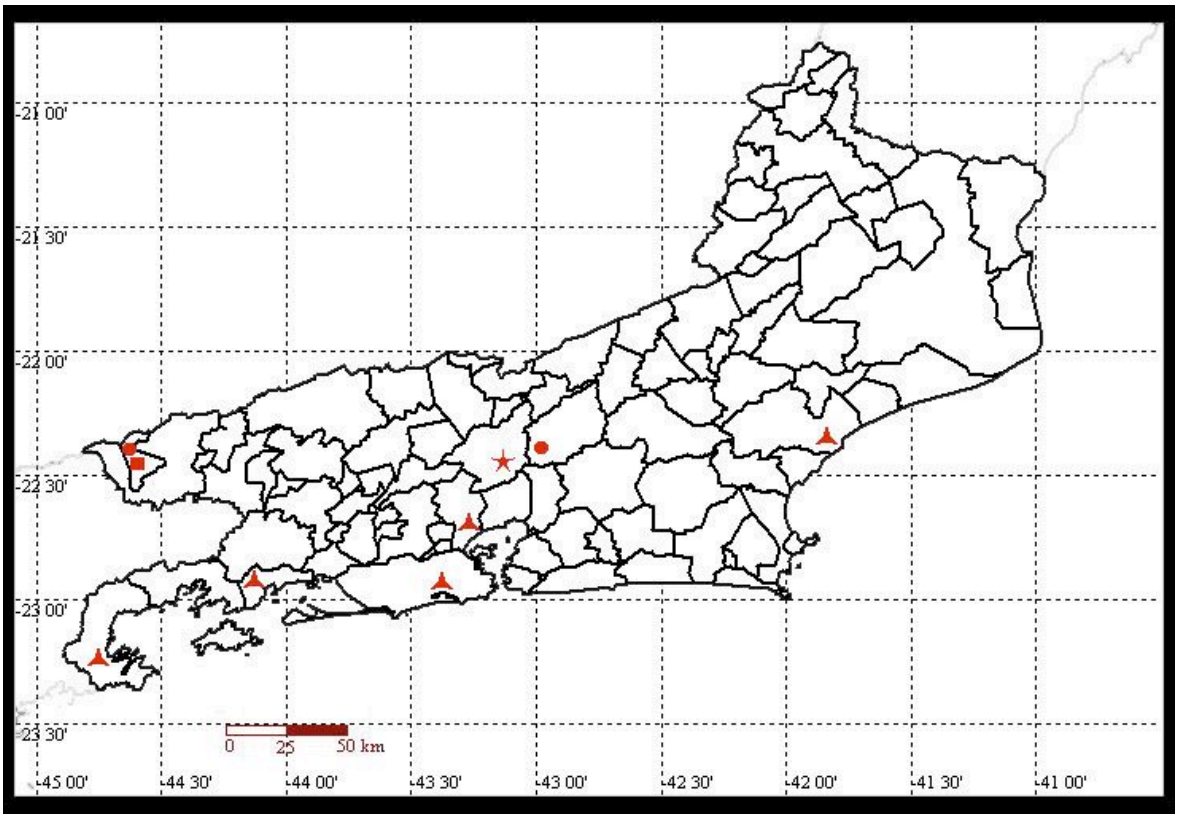


**Figure 32** - Areas of occurrence of *Struthanthus uraguensis* var. *uraguensis* (●), *S. uraguensis* var. *stylandrus* (■), *S. vulgaris* (▲) and *Tripodanthus acutifolius* (★) in the state of Rio de Janeiro.

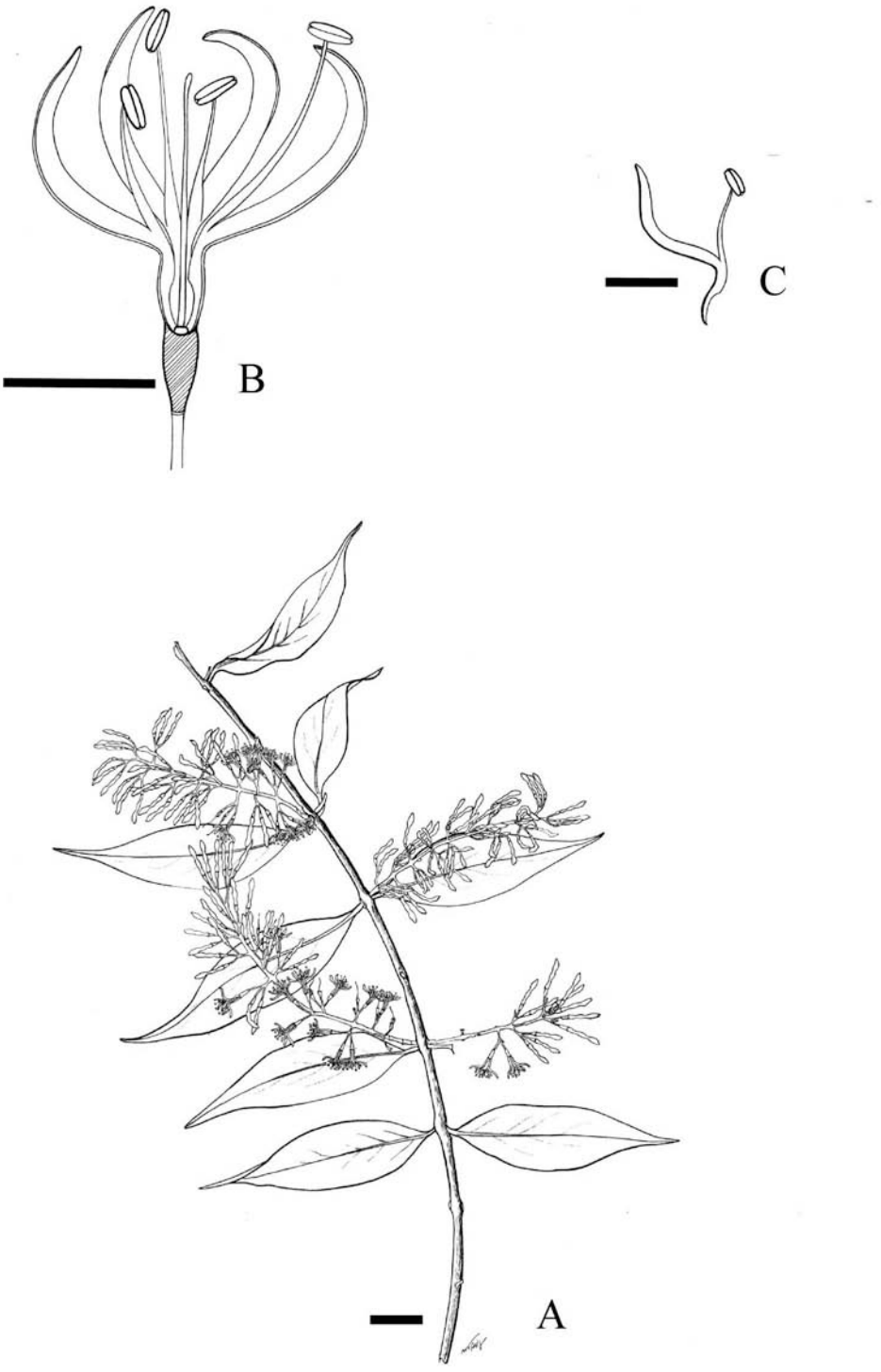


**Figure 33 -** ***Tripodanthus acutifolius*** **(Ruiz** ***et*** **Pav.)Tiegh.:** A – flowering branch (bar = 2 cm); B – dissected flower (bar = 1.5 cm); C – isolated tepal (bar = 1 cm). (*C.H.R. de Paula and R. Bacelar 431*).

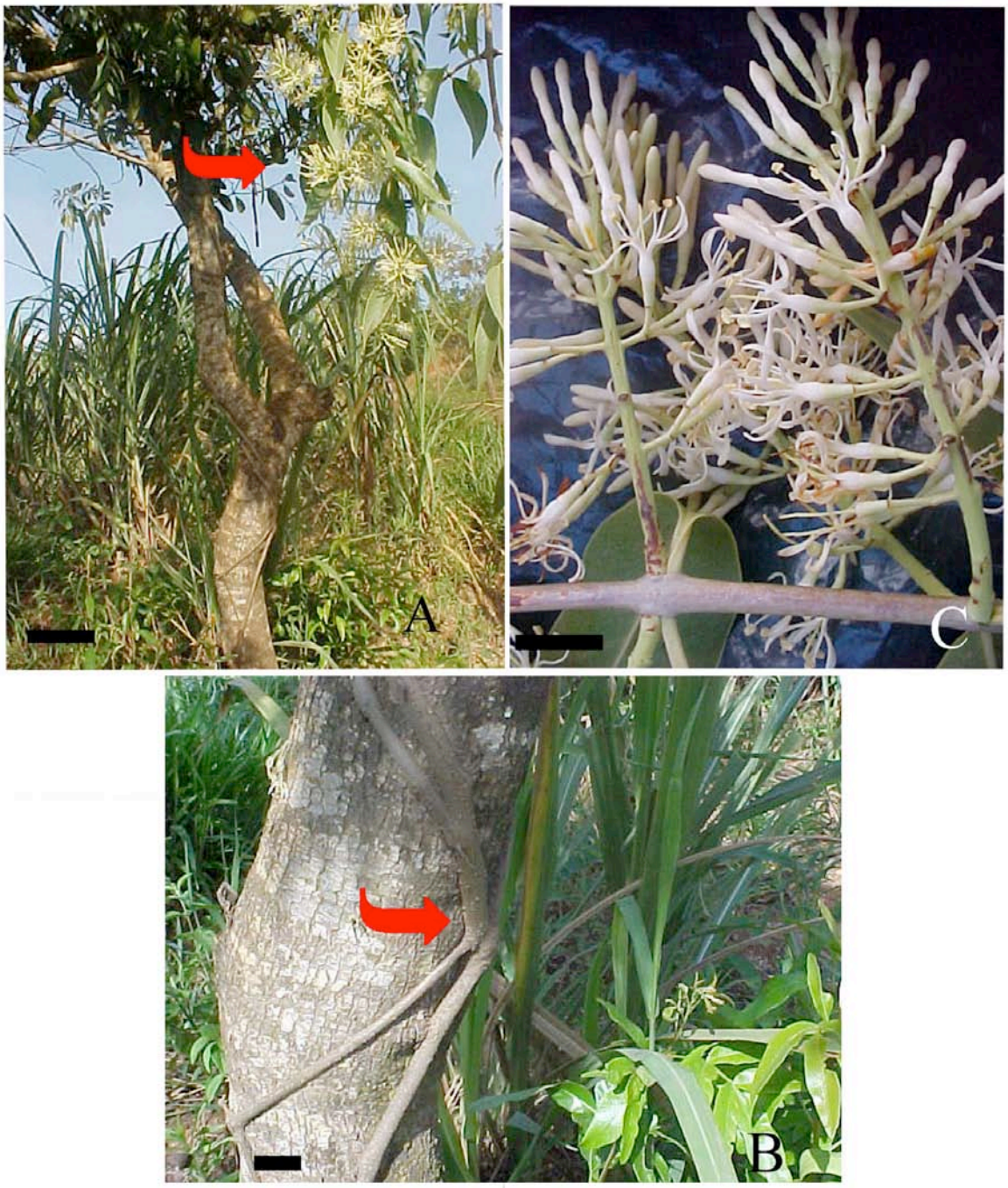


**Figure 34 - *Tripodanthus acutifolius* (Ruiz *et* Pav.) Tiegh.**: A – aspect of a flowering branch (↪) on the host (bar = 3 cm); B – detail of the stem of *T. acutifolius* (↪) around the stem of the host (bar = 2 cm); C – detail of the inflorescence (bar = 1 cm).

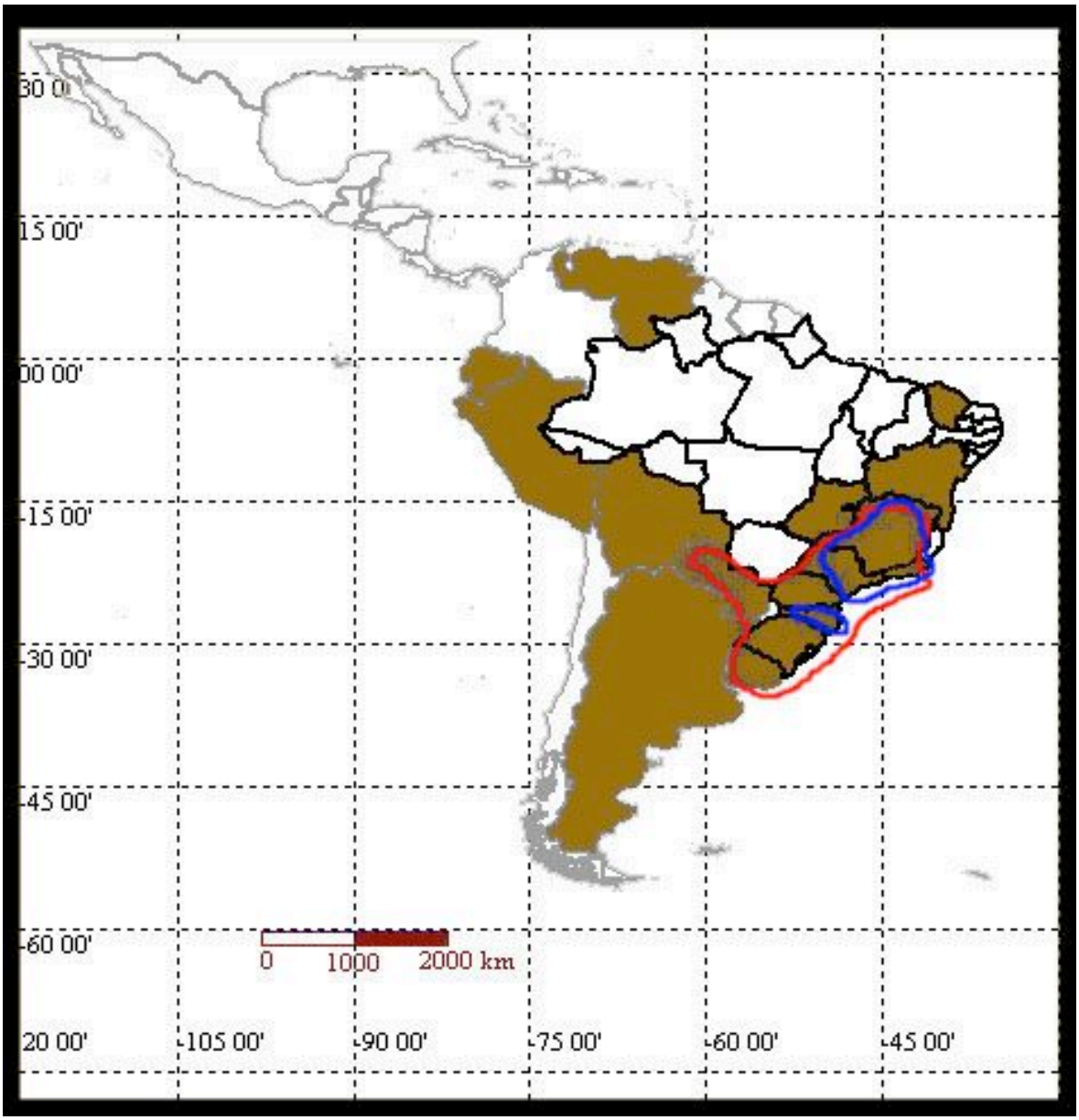


**Figure 35 -** Geographical distribution of *Struthanthus uraguensis* var. *uraguensis* (•), *S. vulgaris* (•) and *Tripodanthus acutifolius* (•).

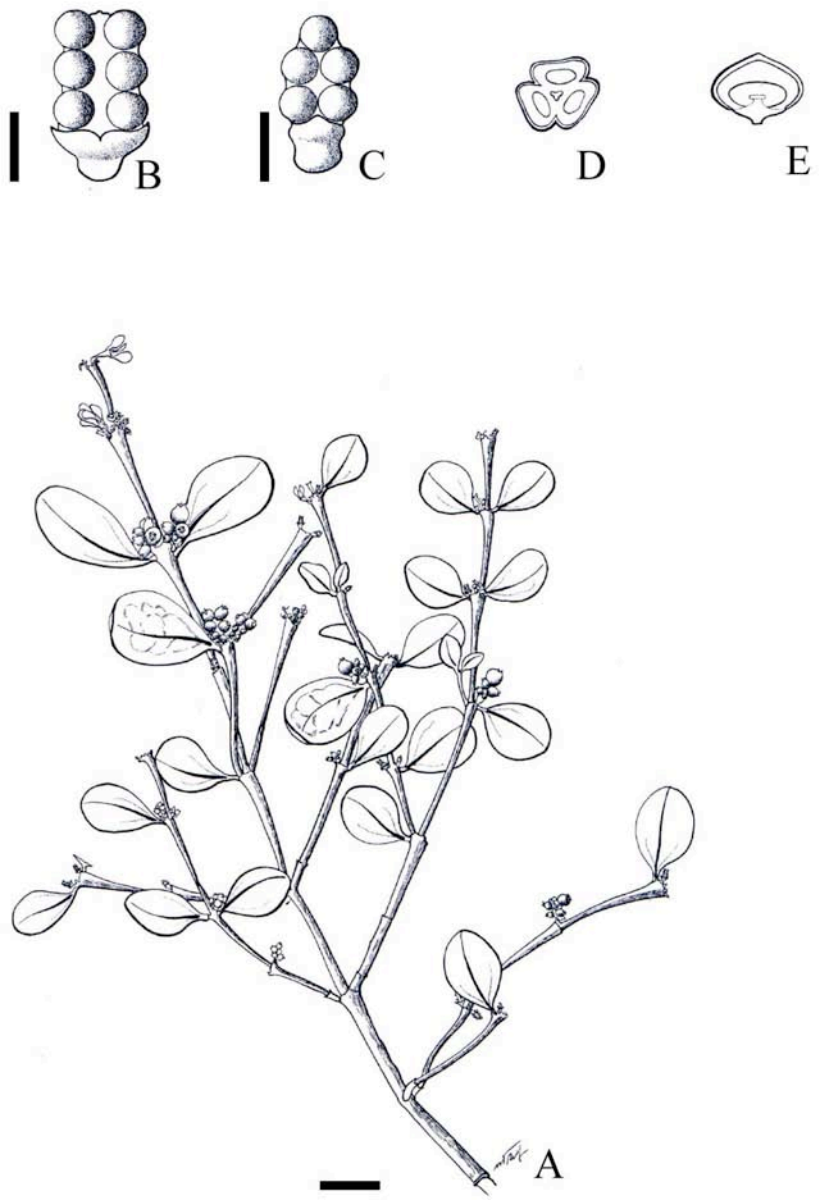


**Figure 36 -** ***Dendrophthora elliptica*** **var.** ***elliptica*****(Gardn.) Krug.** ***et*** **Urb**.: A – flowering branch (bar = 1.5 cm); B – flowering spike in lateral view (bar = 1.5 mm); C – flowering spike in front view (bar = 1.5 mm); D – male flower in transverse section; E- male flower in longitudinal section. (*C.H.R. de Paula et al. 509*).


**Figure 37 - *Dendrophthora elliptica* var. *elliptica*(Gardn.)Krug. e*t* Urb.**: A - three aerial branches (⮑) on *Tibouchina* sp. (bar = 3 cm); B – detail of the infructescence where a mature fruit and various other immature ones can be seen, all with persistent open perigones (bar = 3 cm).

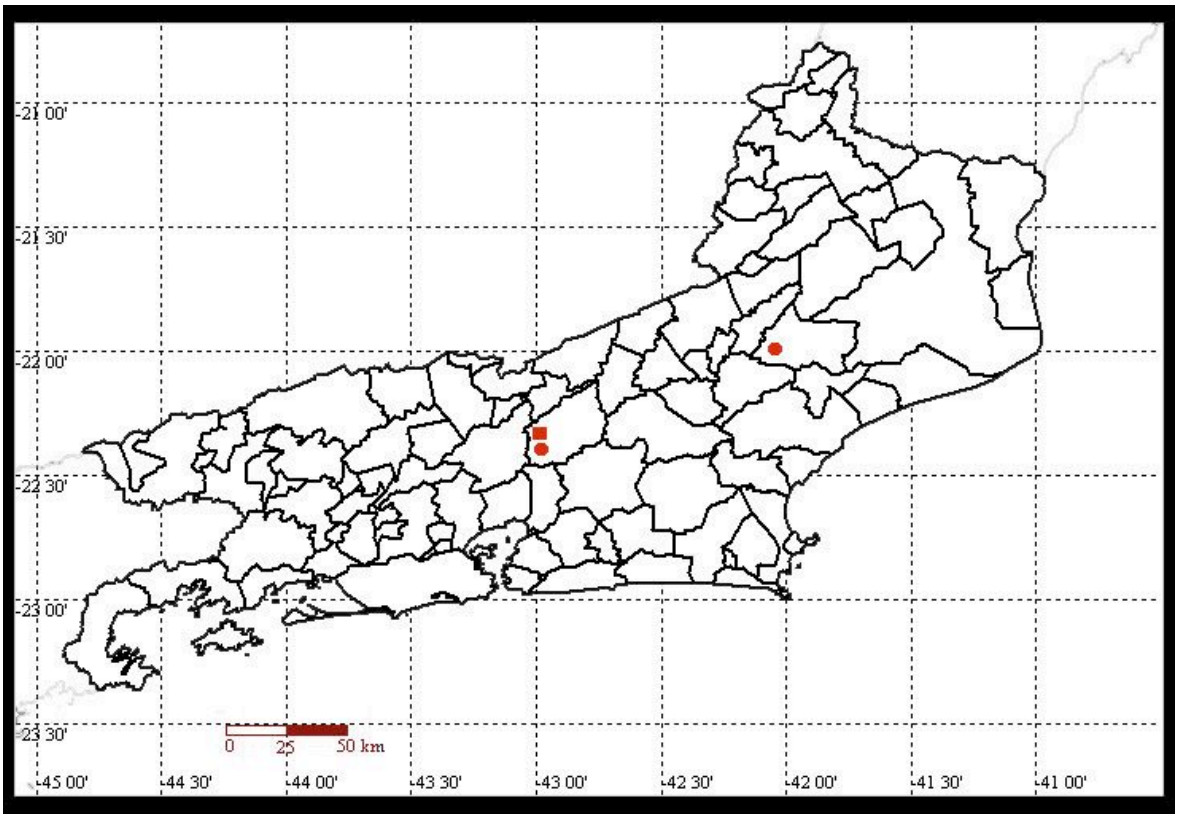


**Figure 38 -** Areas of occurrence of *Dendrophthora elliptica* var. *elliptica* (●) and *D. warmingii* (■) in the state of Rio de Janeiro.

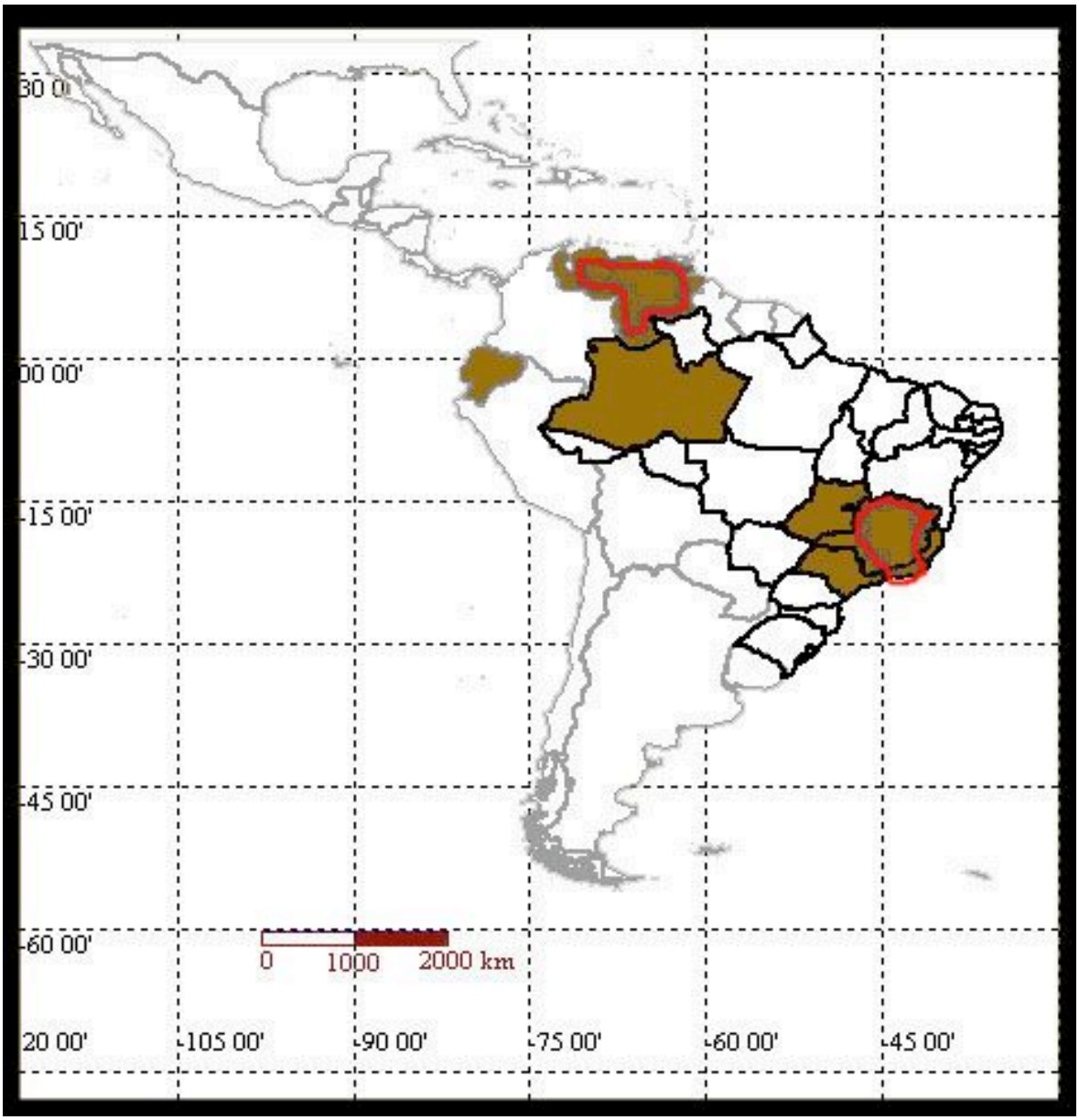


**Figure 39 -** Geographical distribution of *Dendrophthora elliptica* var. *elliptica* (•) and *D. warmingii* (•).

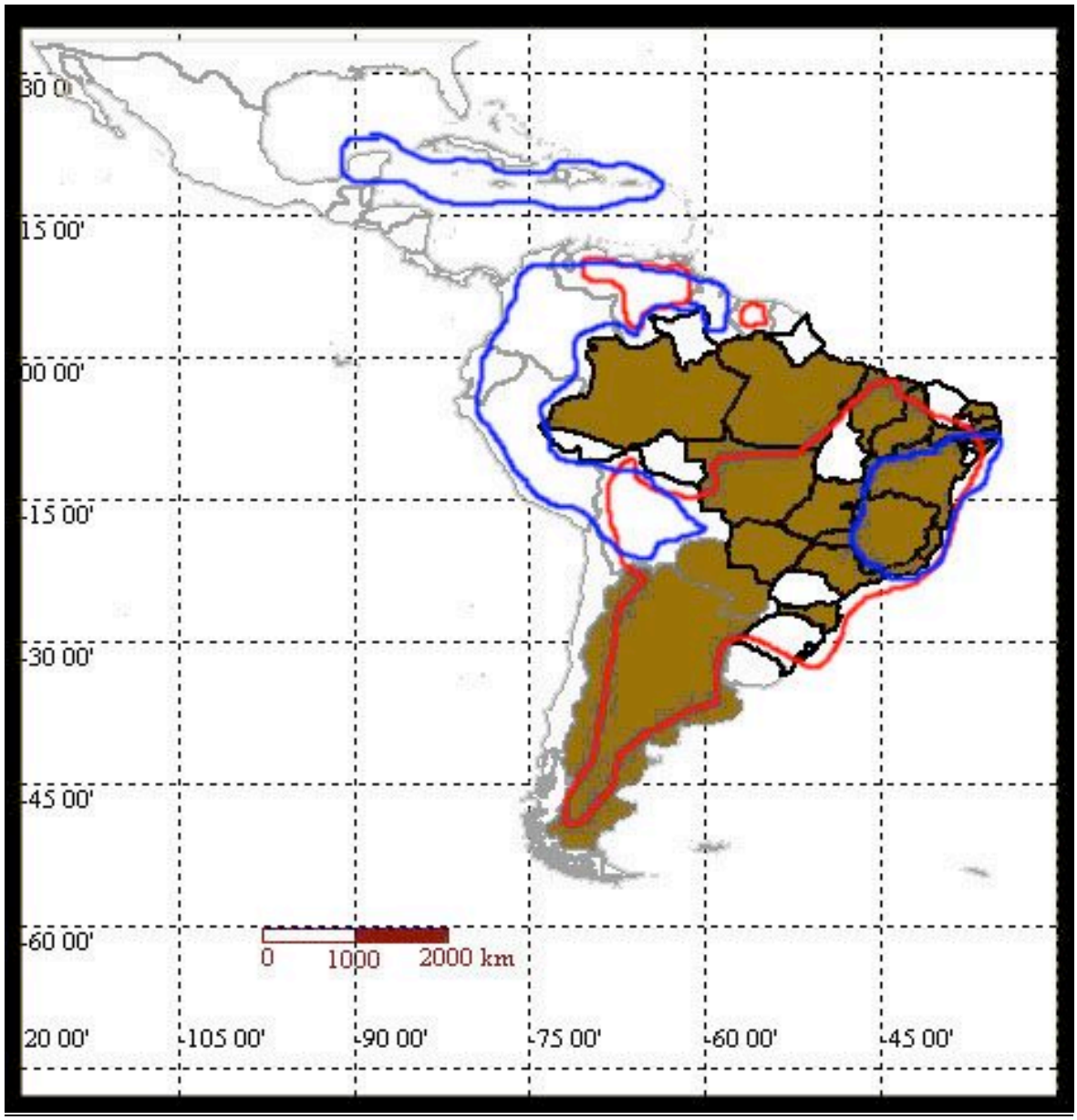


**Figure 40** - Geographical distribution of *Phoradendron affine* (●), *P. bathyoryctum* (●) and *P. chrysocladon* (●).

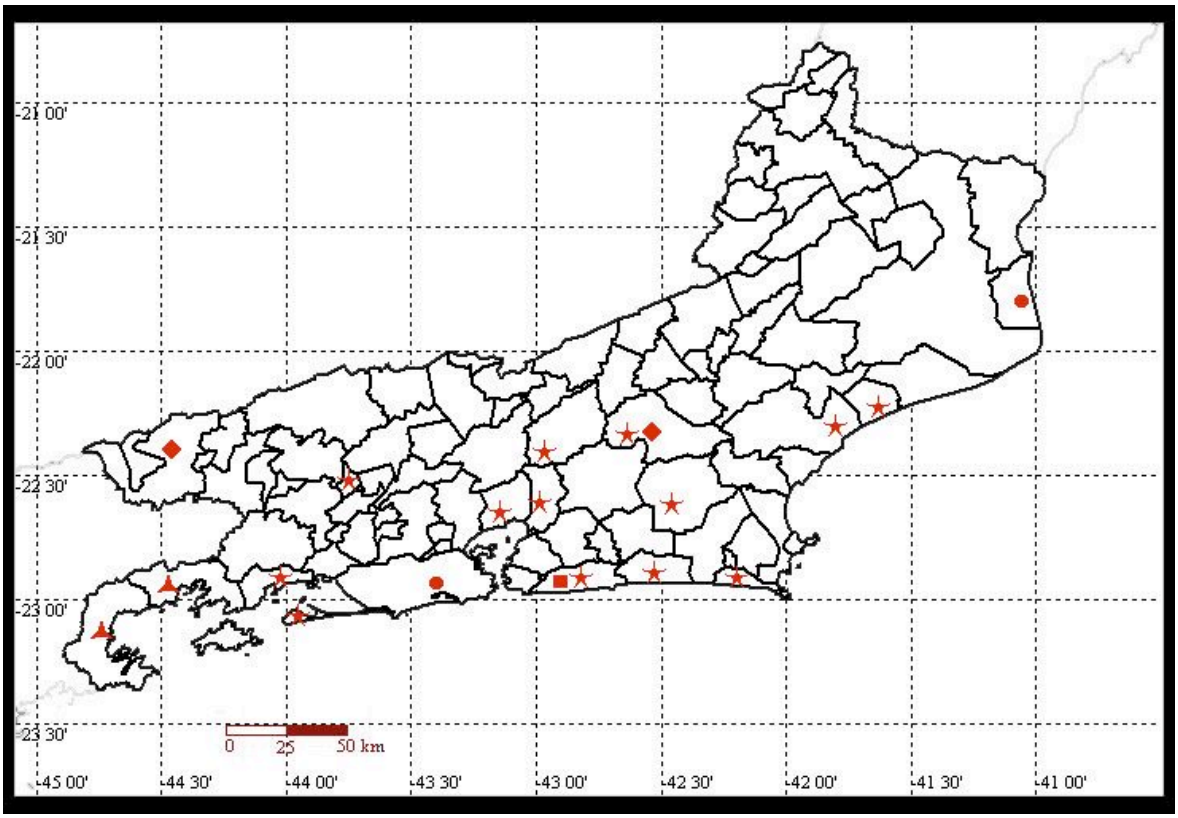


**Figure 41 -** Areas of occurrence of *Phoradendron affine* (●), *P. bathyoryctum* (■), *P. chrysocladon* (▲), *P. crassifolium* (★) and *P. dipterum* (◆) in the state of Rio de Janeiro.

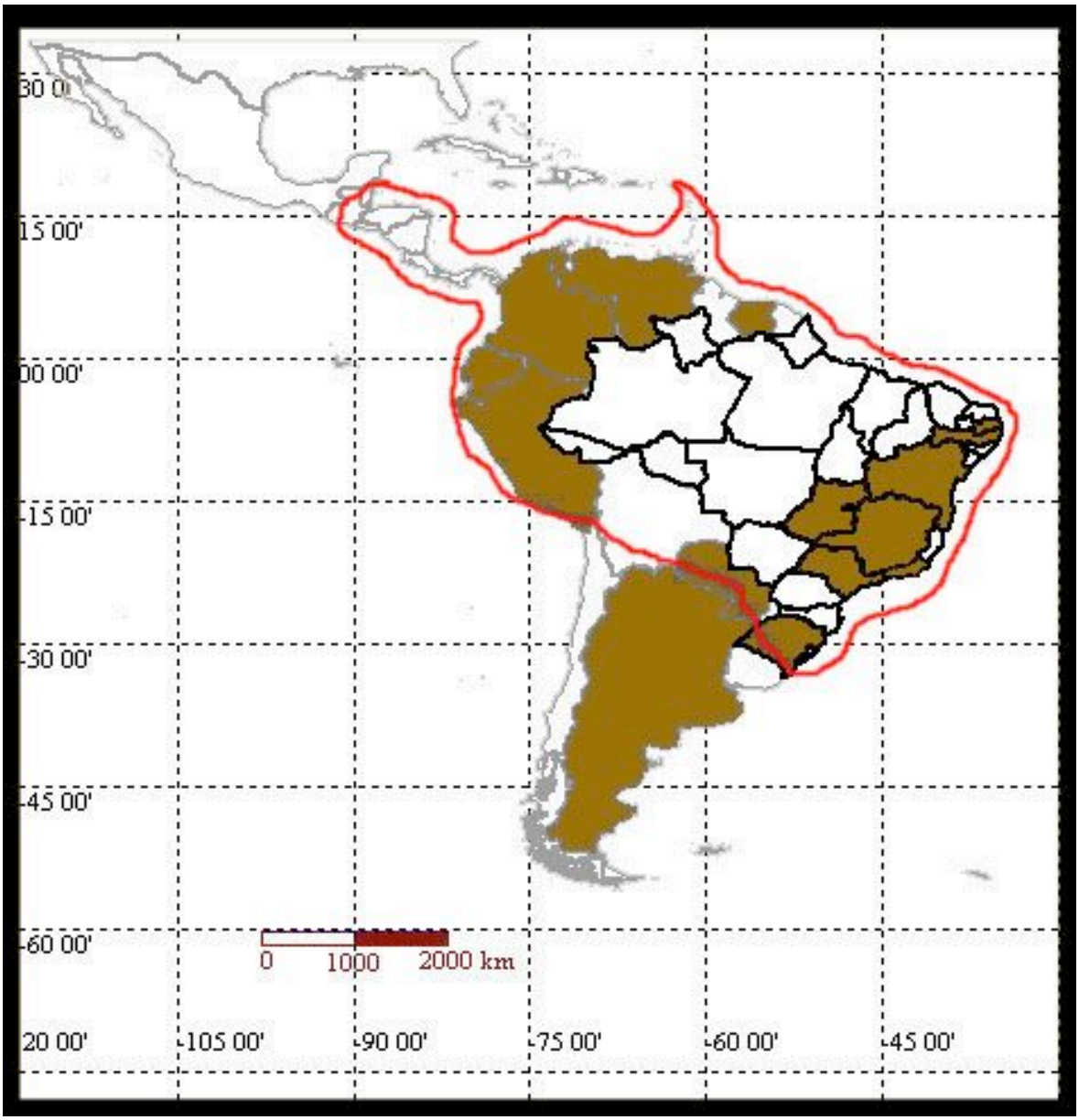


**Figure 42 -** Geographical distribution of *Phoradendron crassifolium* (•) and *P. dipterum* (•).

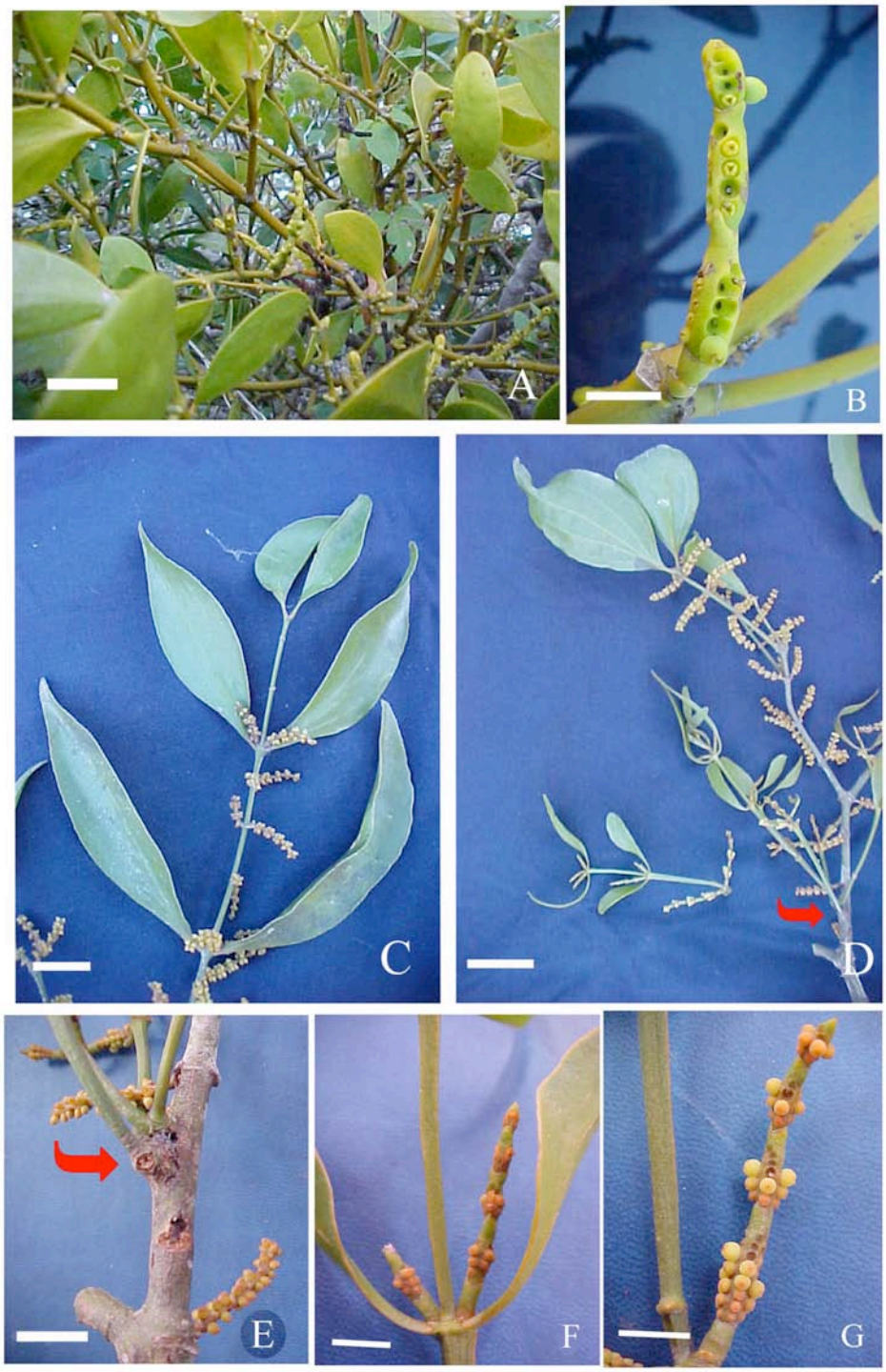


**Figure 43 -** ***Phoradendron bathyoryctum*** **Eichl.**: A – branches with leaves and spikes (bar = 2 cm); B- detail of the spike (bar = 1 cm). ***Phoradendron crassifolium*** **(Pohl *ex* DC.) Eichl.**: C- branch with fertile sheathing intercallary cataphylls (bar = 2 cm); D- branch parasitized by *P. dipterum* (➥) (bar = 1 cm); E- detail of the insertion of *P. dipterum* (➥) on *P. crassifolium* (bar = 1.5 cm). ***Phoradendron dipterum*** **Eichl.**: F – detail of branch with spikes (bar = 1 cm); G – detail of the fruiting spike (bar = 1 cm).

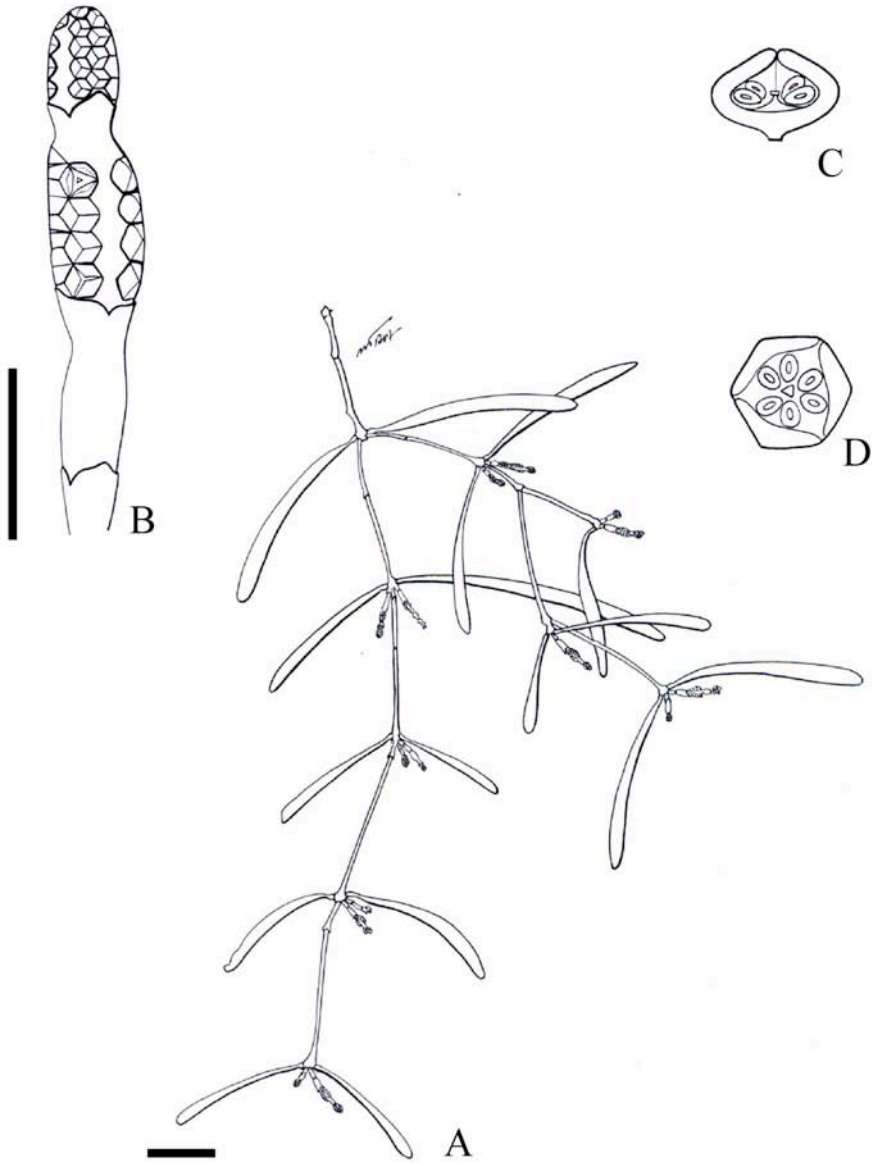


**Figure 44 -** ***Phoradendron linearifolium*** **Eichl**.: A – flowering branch of the male plant (bar = 2cm); B –spike with two sterile basal articulations and two floriferous ones; C - male flower in longitudinal section showing two sessile bithecal anthers; D - male flower in longitudinal section showing its three anthers and a rudimentary central stigma. (*C.H.R. de Paula and A. Lobão 174*).

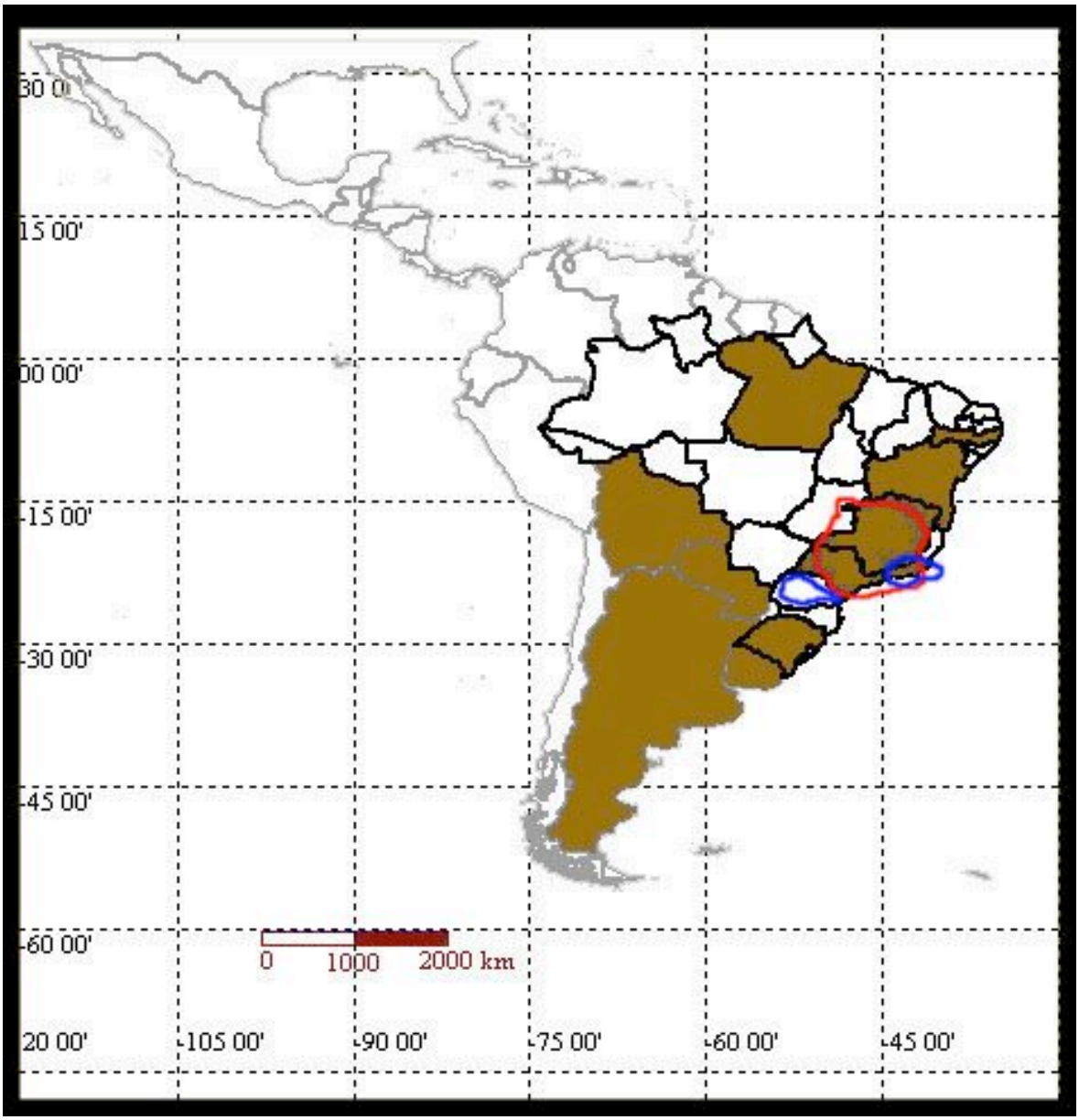


**Figura 45 –** Geographic distribution of *Phoradendron falcifrons* (●), *P. fragile* (●) and *P. linearifolium* (●).

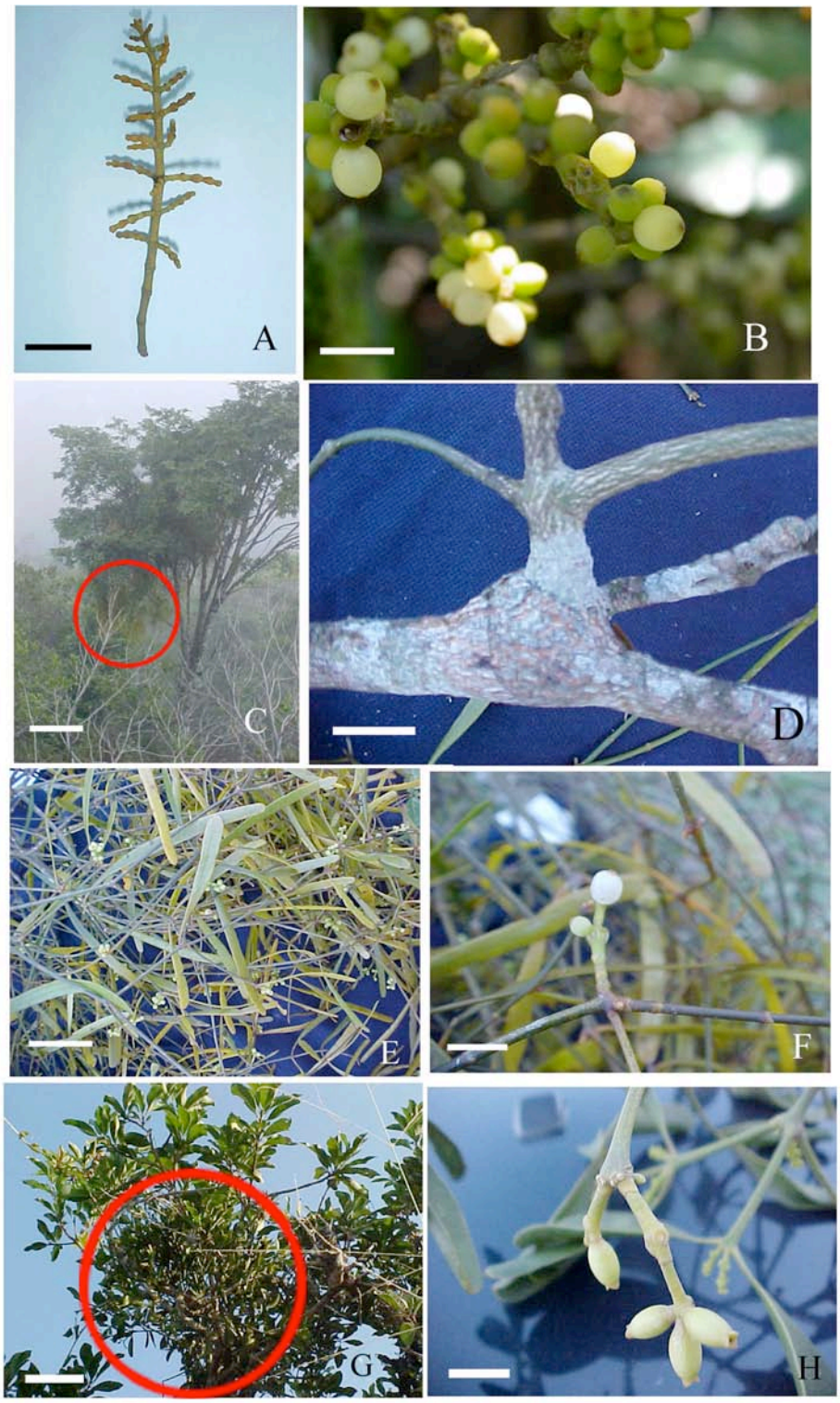


**Figure 46 -** ***Phoradendron fragile*** **Urb**.: A – aspect of the flowering branch (bar = 4 cm); B – detail of the fruits (bar = 5 mm). ***Phoradendron linearifolium*** **Eichl.**: C – aspect of an individual on the host (bar = 1 m); D – detail of the insertion on the host (bar = 1 cm); E – detail of the branches and leaves (bar = 2 cm); F – detail of the fruit (bar = 1 cm). ***Phoradendron obtusissimum*** **(Miq.) Eichl.**: G - individual on the host (bar = 10 cm); H – detail of the fruit (bar = 1 cm).

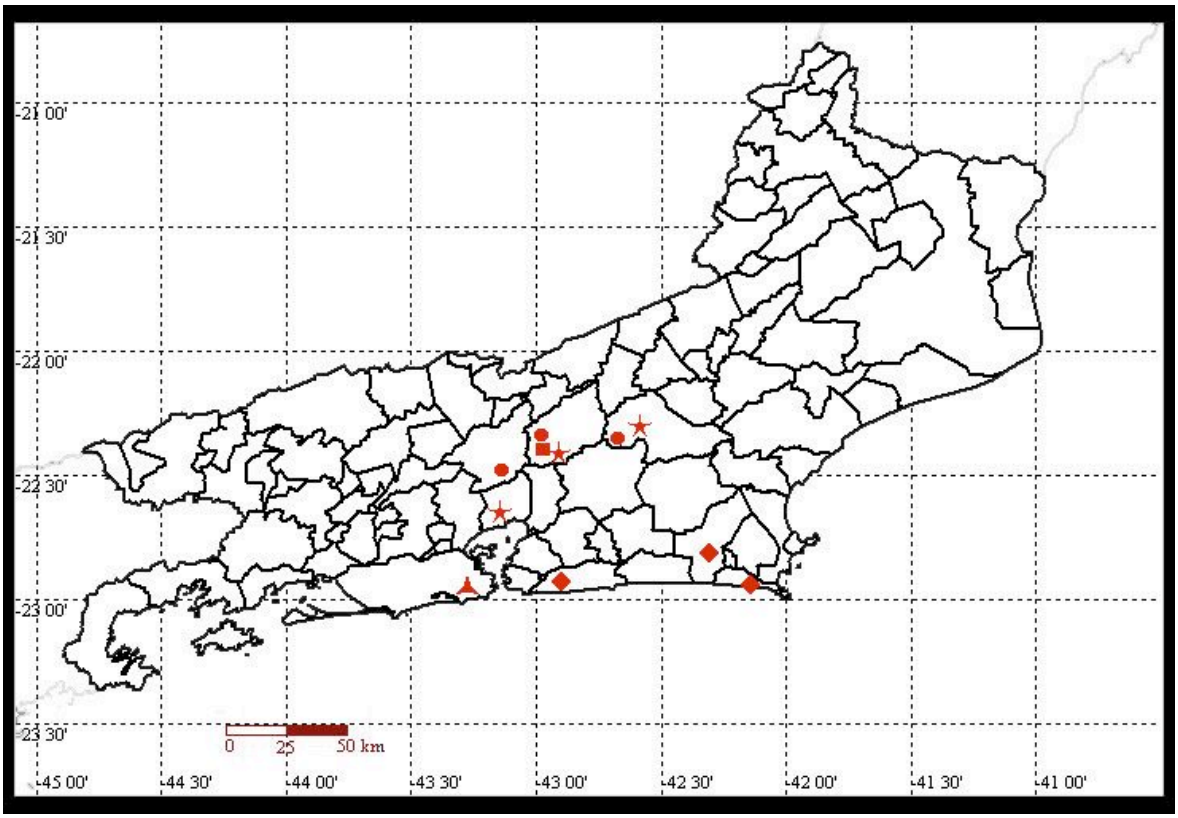


**Figure 47 -** Areas of occurrence of *Phoradendron falcifrons* (■), *P. fragile* (●), *P. linearifolium* (★), *P. nigricans* (▲) and *P. obtusissimum* (◆)in the state of Rio de Janeiro.

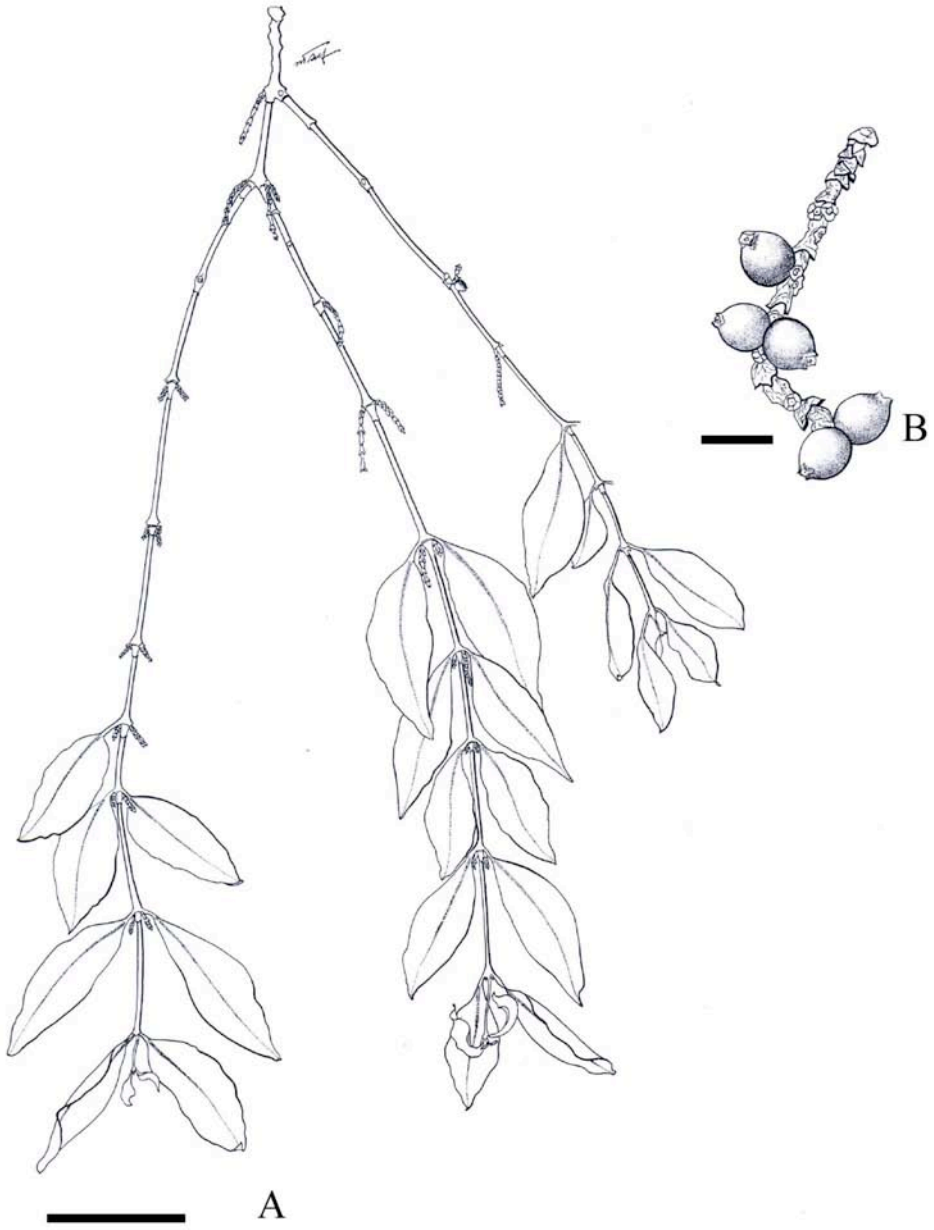


**Figure 48 -*Phoradendron piperoides* (Kunth.)Trel.**: A- fruiting branch (bar = 3 cm); B- spike with five mature fruits and various empty fovea (bar = 5 mm) (*C.H.R. de Paula and A. Calvente 509*).

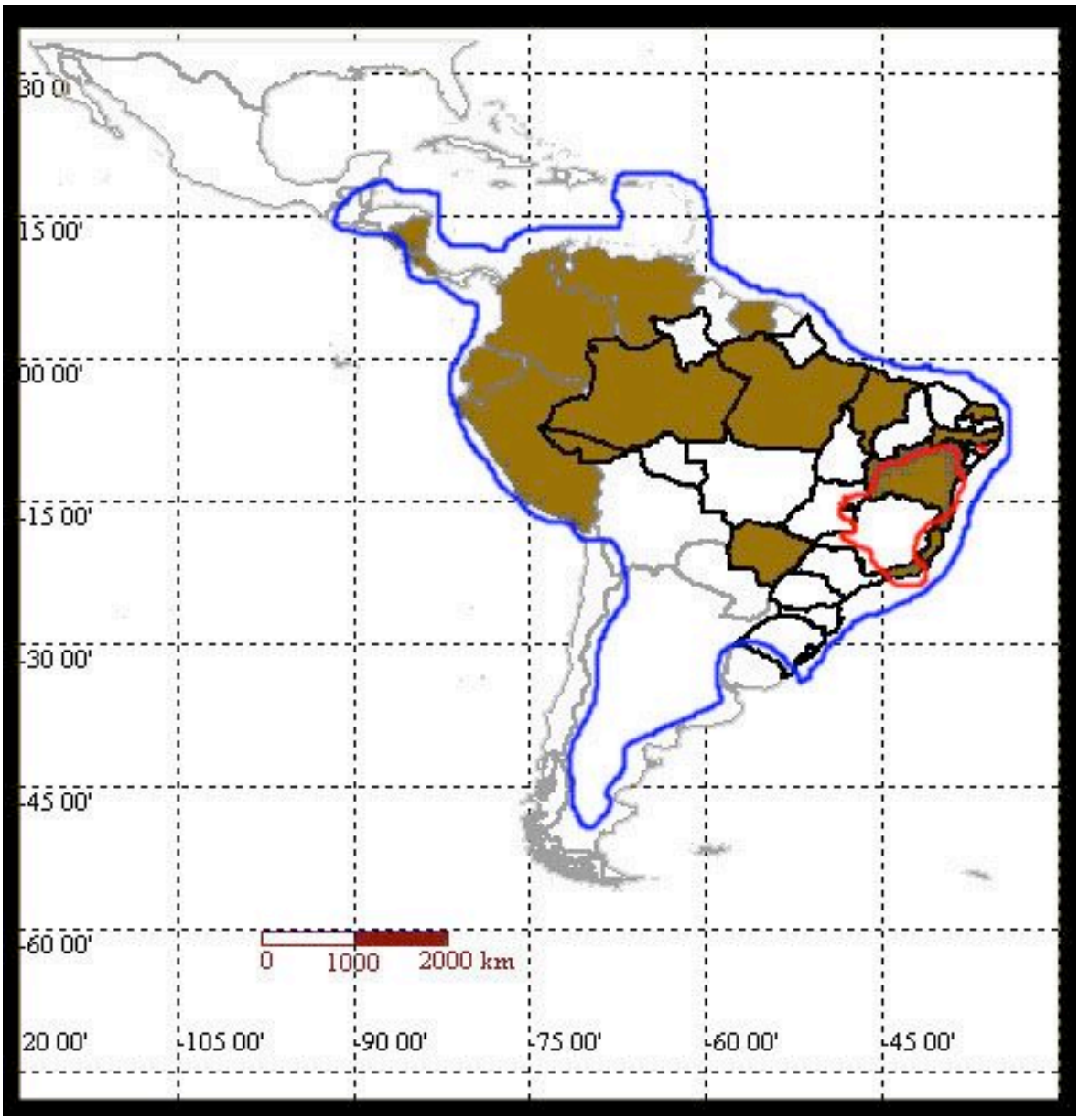


**Figure 49 -** Geographical distribution of *Phoradendron nigricans* (•), *P. obtusissimum* (•) and *P. piperoides* (•).


**Figure 50 -** ***Phoradendron piperoides*** **(Kunth.) Trel.**: A – aspect of the branch with flowering spikes (bar = 3 cm); B - aspect of the branch with fruiting spikes (bar = 3 cm). ***Phoradendron quadrangulare*** **(Kunth.) Griseb.**: C – aspect of an individual on the host (bar = 20 cm); D – detail of the spike with fruits (bar = 5 mm); E – detail of viscin expelled from the pericarp (bar = 1 cm).

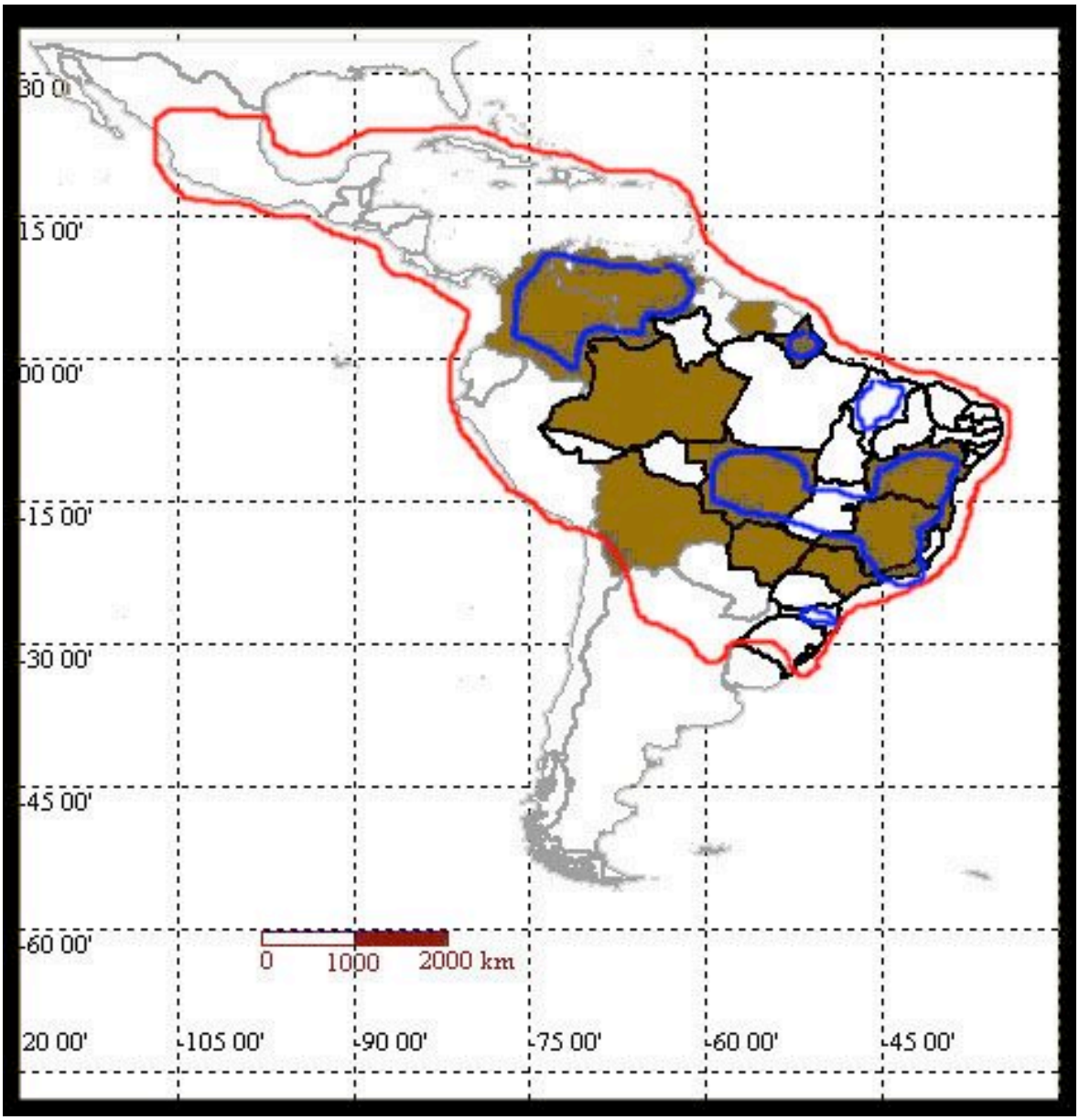


**Figure 51 -** Geographical distribution of *Phoradendron pteroneuron* (•), *P. quadrangulare* (•) and *P. strongylocladus* (•).


**Figure 52 -** ***Phoradendron undulatum*** **(Pohl.** ***ex*** **DC.) Eichl.:** A – sectioned branch at the ancipital internode (bar = 1 cm); B – branchlet with sheathing cataphylls evident (↪) (bar = 1.5 cm); C – detail of the fruiting spike (bar = 5 mm). ***Phoradendron tunaeforme*** **(DC.) Eichl.**: D – aspect of an individual (bar = 1.5 cm).

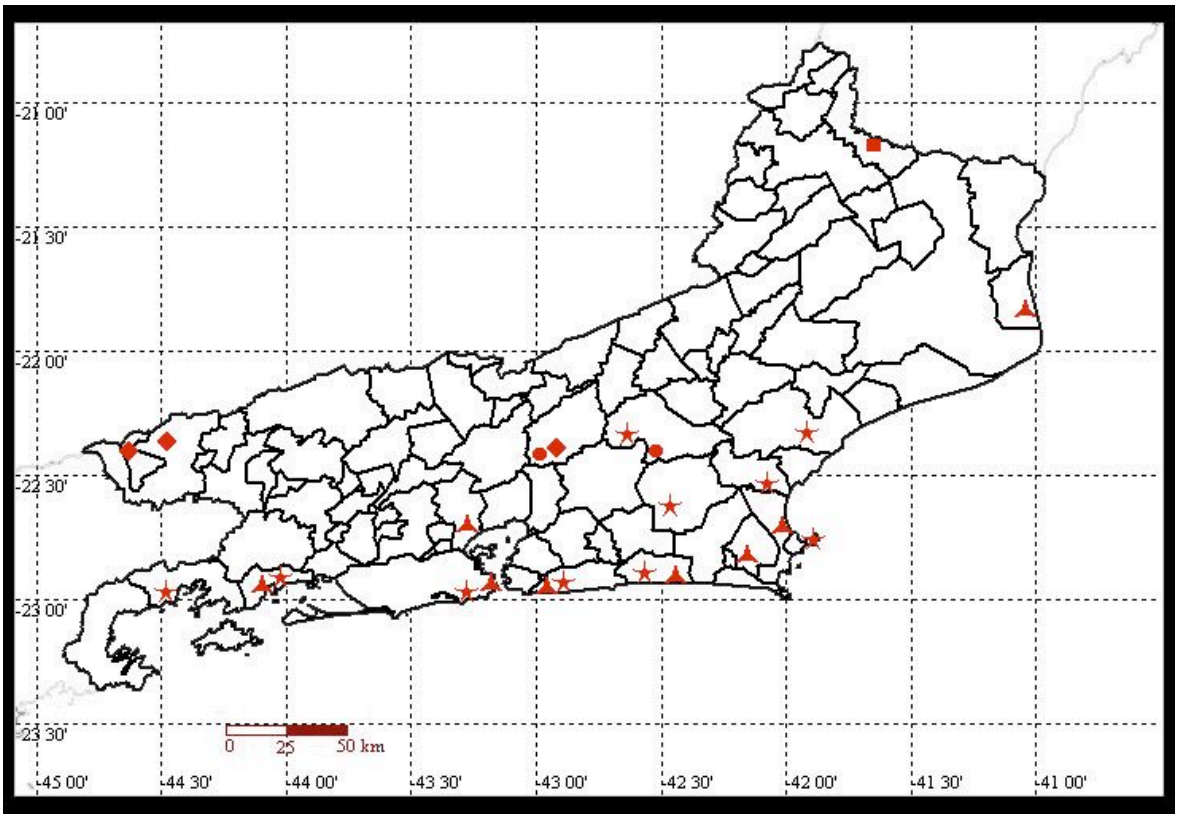


**Figure 53 -** Areas of occurrence of *Phoradendron piperoides* (★), *P. pteroneuron* (●), *P. quadrangulare* (▲), *P. strongylocladus* (■) and *P. undulatum* (◆) in the State of Rio de Janeiro.

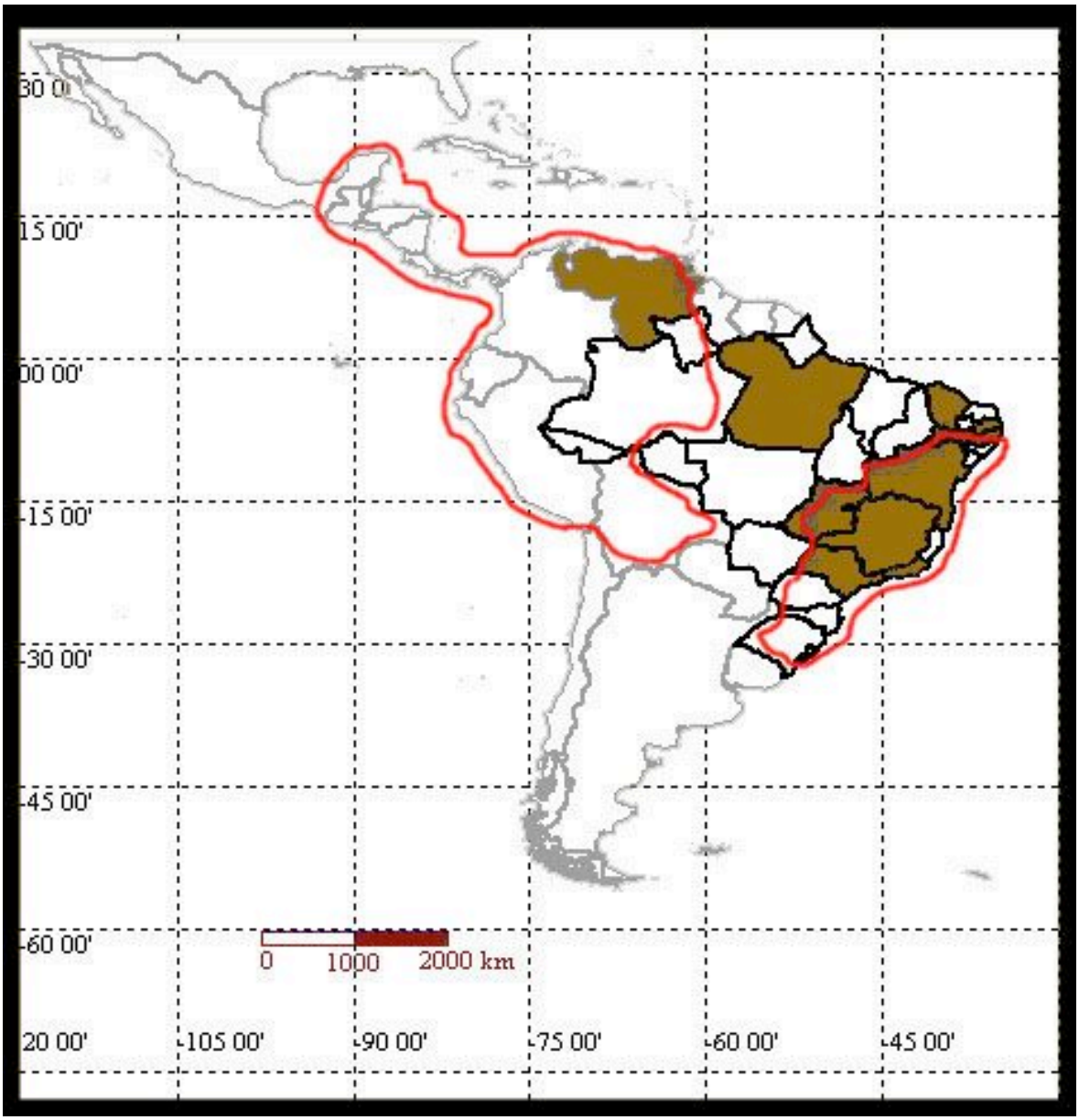


**Figure 54 -** Geographical distribution of *Phoradendron tunaeforme* (•) and *P. undulatum* (•).