A NEW INSULAR SPECIES OF PITVIPER FROM BRAZIL, WITH COMMENTS ON EVOLUTIONARY BIOLOGY AND CONSERVATION OF THE BOTHROPS JARARACA GROUP (SERPENTES, VIPERIDAE)

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ABSTRACT: We describe a new pitviper species, Bothrops alcatraz, of the Bothrops jararaca group, from Alcatrazes Island, off the coast of São Paulo, southeastern Brazil. It differs from the mainland coastal populations of B. jararaca in southeastern Brazil mostly by its darker coloration; smaller size; lower number of ventrals, subcaudals, and infralabials; number and shape of anterior cephalic scales; shape of hemipenis spines; intense coagulant activity of venom; and three specific venom proteins. From Bothrops insularis, another island species from southeastern Brazil, the new species differs mainly by its color pattern, smaller size, lower number of subcaudals in males, and absence of hemiclitoris in females. Bothrops alcatraz presents some features that may be viewed as paedomorphic within the B. jararaca group, such as small adult size, proportionally large eyes, intense coagulant venom activity, and diet composed of centipedes and lizards. We postulate that the dwarfism and characteristics of venom in B. alcatraz may be related to its diet (similar to that of juveniles of the mainland B. jararaca). Bothrops alcatraz and B. insularis may have originated through the isolation of populations of a B. jararaca-like ancestor on the Alcatrazes and Queimada Grande islands, respectively. The new species is regarded as critically endangered due to its very small area of occurrence and the declining quality of its habitat.

Key words: Bothrops alcatraz; Crotalinae; Evolution; Island endemics; Natural history; Southeastern Brazil

The systematics of snakes of the genus Bothrops is notoriously difficult (Campbell and Lamar, 1989; Hoge and Romano-Hoge, 1981; Werman, 1992), although several species groups have been recognized recently (Cadle, 1992; Gutberlet, 1998;
Salomão et al., 1997, 1999; Werman, 1992). The genus is probably paraphyletic (see Gutberlet, 1998; Parkinson, 1999), and comprises about 40 species including those previously allocated in Bothriopsis (Gutberlet, 1998; Parkinson, 1999; Salomão et al., 1997, 1999; Vidal et al., 1999).

Members of two groups of Bothrops occur on coastal islands on southeastern Brazil. Snakes related to Bothrops jararaca (Wied), including Bothrops insularis (Amaral), are known from several islands of various sizes and distances from the coast (up to about 35 km), ranging from Franceses Island off Espírito Santo (latitude about 21° 00' S) south to Santa Catarina Island (latitude about 27° 30' S), whereas Bothrops jararacussu (Lacerda) is more restricted in its distribution and occurs mainly on larger islands close to the coast of São Paulo (<1 km from the mainland; Amaral, 1921a; Duarte et al., 1995; Luederwaldt and Fonseca, 1923; personal observation). Island populations of snakes are good subjects for evolutionary studies, especially when compared to their generally widespread mainland relatives (e.g., Forsman, 1991; Schwaner, 1985). These populations also deserve special attention for conservation as they generally occur exclusively in very restricted areas (e.g., 43 ha in the case of B. insularis, Duarte et al., 1995).

The B. jararaca group comprises two species (Salomão et al., 1999), the widespread B. jararaca, probably a complex of several species (Salomão et al., 1997), and the insular endemic B. insularis. The latter species is restricted to Queimada Grande Island, off the coast of São Paulo, southeastern Brazil (Campbell and Lamar, 1989). Herein, we describe a second insular pitviper species from Brazil, first collected in 1914 and previously referred to the widespread species B. jararaca (e.g., Luederwaldt and Fonseca, 1923).

**Materials and Methods**

We examined 24 specimens of the new insular species and 39 specimens of B. jararaca from adjacent continental populations of coastal São Paulo (Appendix I) in the collection of Instituto Butantan (IB) and Museu de História Natural da Universidade Estadual de Campinas (ZUEC). For each snake, we measured the snout-vent length (SVL) and tail length (TL) to the nearest 1 mm with a flexible rule. Head length (HL; from snout to extreme posterior part of mandible) and eye diameter (ED) were measured with a caliper to the nearest 0.1 mm; to compare HL and ED between species, we divided HL by the “trunk” length (TR = SVL − HL) and ED by HL. Mass (to the nearest 1 g) was obtained with spring scales after draining the excess preservative liquid through ventral incisions; to compare mass between species, we divided mass by total length (TTL). Description and scale counts follow Campbell (1985). We considered the first ventral as being the first scale wider than long. Additionally, we counted the anterior cephalic scales (i.e., the total number of cephalic scales, including the intersupraoculars) to the tip of the snout. Hemipenial ornamentation names follow Dowling and Savage (1960). Color names follow Kornerup and Wanscher (1961). Data for B. insularis in Table 1 are from Amaral (1921a). Data on microhabitat use, feeding, and reproduction were obtained during fieldwork and by examining preserved specimens in museum collections.

The population of pitvipers inhabiting Alcatrazes Island is well differentiated from both populations of snakes occurring in Queimada Grande Island (B. insularis) and on adjacent mainland (B. jararaca). After carefully analyzing the morphological and ecological attributes of the Alcatrazes pitviper, we concluded that the Alcatrazes Island population represents a distinctive species that may be known as:

**Bothrops alcatraz sp. nov.**

**Holotype.**—IB 62545 (Fig. 1), male from Alcatrazes Island (24° 06' S, 45° 42' W), São Sebastião, São Paulo State, Brazil, 15 December 1999, collected by O. A. V. Marques, M. Martins, M. E. Oliveira, D. N. Pereira and A. Martensen.

**Paratypes.**—Eighteen specimens, all from the type locality: MZUSP 1453, October 1920, collected by H. Luederwaldt; ZUEC 2224, male, 22 March 2000, col-
FIG. 1.—Bothrops alcatraz type locality and two specimens in situ. Alcatrazes Island photographed from a nearby islet with two brown boobies in foreground (upper left); the Atlantic forest on Alcatrazes Island (upper right); holotype (IB 62545), showing gaping behavior and seabird droppings on the head (lower left); male (IB 62290) showing body proportions, dorsal pattern, and seabird droppings scattered on the adjacent ground (lower right). Photos of the island by F. P. de Campos.


**Diagnosis.**—The new species is superficially similar to *B. jararaca* from coastal São Paulo, from which it may be distinguished by the following combination of characters (*B. jararaca* in parentheses): smaller adult size, mean male TTL 425.6 ± 32.5, range 365–462 mm (versus 801.6 ± 107.6 mm, range 378–924 mm); mean female TTL 455.7 ± 41.4, range 365–505 mm (versus 969.0 ± 107.1, range 337–1080 mm); shorter tail, TL/SVL 0.161 ± 0.007 (0.168 ± 0.009) in males, 0.138 ±
Fig. 2.—Heads of Bothrops alcatraz (paratypes IB 587 and IB 585, upper) and Bothrops jararaca (IB 57903 and IB 58130, lower) in dorsal view showing variation in scation. Line = 5 mm.

0.011 (0.144 ± 0.012) in females; longer head, HL/TR 0.0053 ± 0.0003 (0.0041 ± 0.0002) in males, 0.0055 ± 0.0003 (0.0045 ± 0.0010) in females; larger eyes, ED/HL 0.157 ± 0.010 (0.149 ± 0.010) in males, 0.154 ± 0.009 (0.126 ± 0.022) in females; 32–50, 37.5 ± 4.2, anterior cephalic scales generally rounded and with no or feeble keels (32–64, 47.0 ± 8.2, generally elongate and distinctly keeled, Fig. 2); lower number of infralabials usually 10/10 (usually 11/11); lower number of ventrals, 173–186 (197–218); lower number of subcaudal scales in males 47–58 (62–72) and in females 45–52 (53–68) (Table 1), and hemipenis spines relatively slender (stouter in B. jararaca) (Fig. 3). Additional characters that distinguish B. alcatraz from B. jararaca are the presence of three venom proteins with molecular weights of 20, 40, and 60 kD, which do not occur in B. jararaca, and the intense coagulant activity of venom of adult B. alcatraz (M. F. D. Furtado, personal communication), a character that occurs only in juvenile B. jararaca (Furtado et al., 1991). From B. insularis, the new species is easily distinguished by color pattern and smaller size (Campbell and Lamar, 1989: Figs. 214 and 215), and lower number of subcaudals in males (47–54 versus 55–65, respectively). An additional diagnostic character of B. insularis is presence of the hemiclitoris (cf. Ziegler and Böhme, 1997) in females. Furthermore, Bothrops alcatraz is known only from Alcatrazes Island, whereas B. insularis is known only from Queimada Grande Island, and B. jararaca...
TABLE 1.—Comparison of selected characters of Bothrops alcatraz, coastal specimens of B. jararaca, and B. insularis. Measurements in mm, number of individuals in parentheses.

<table>
<thead>
<tr>
<th>Character</th>
<th>B. alcatraz</th>
<th>B. jararaca*</th>
<th>B. insularis**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snout–vent length males</td>
<td>365–462 (10)</td>
<td>378–996 (15)</td>
<td>393–788 (94)</td>
</tr>
<tr>
<td>Snout–vent length females</td>
<td>365–505 (14)</td>
<td>320–1080 (24)</td>
<td>332–802 (106)</td>
</tr>
<tr>
<td>Ventral males</td>
<td>173–182 (10)</td>
<td>200–211 (15)</td>
<td>171–188 (94)</td>
</tr>
<tr>
<td>Ventral females</td>
<td>175–186 (14)</td>
<td>197–218 (19)</td>
<td>176–195 (106)</td>
</tr>
<tr>
<td>Subcaudals males</td>
<td>47–54 (10)</td>
<td>62–72 (15)</td>
<td>55–65 (94)</td>
</tr>
<tr>
<td>Subcaudals females</td>
<td>45–52 (14)</td>
<td>53–68 (19)</td>
<td>48–59 (106)</td>
</tr>
<tr>
<td>Mid-body scale rows</td>
<td>22–26 (24)</td>
<td>21–27 (34)</td>
<td>23–25 (200)</td>
</tr>
<tr>
<td>Intersupraoculars</td>
<td>6–8 (24)</td>
<td>7–10 (34)</td>
<td>7–9 (203)</td>
</tr>
<tr>
<td>Anterior cephalics</td>
<td>31–48 (24)</td>
<td>31–64 (34)</td>
<td>—</td>
</tr>
<tr>
<td>Infraoculars</td>
<td>10/10 (19); 10/11 (4); 9/10 (1)</td>
<td>10/10 (6); 10/11 (5); 9/11 (1); 11/11 (15); 11/12 (4); 12/12 (2); 12/10 (1)</td>
<td>—</td>
</tr>
<tr>
<td>Hemipenal spines</td>
<td>stout</td>
<td>slender</td>
<td>—</td>
</tr>
<tr>
<td>Postorbital stripe</td>
<td>present</td>
<td>present</td>
<td>absent or faint</td>
</tr>
</tbody>
</table>

* From coastal São Paulo.
** Data from Amaral (1921a).

is a widespread species in southeastern Brazil, both on the mainland and on some larger islands close to the coast (Campbell and Lamar 1989, personal observation).

**Etymology.**—The specific epithet is a noun in apposition and refers to the local name of the frigate bird, Fregata magnificens (Pelecaniformes), whose colonies on the Alcatrazes Island give name to the type locality of the new species. We suggest the common name “Alcatrazes lancehead” for the new species.

**Description of holotype.**—An adult male (Fig. 1) preserved in ethanol with both hemipenes everted; SVL 448 mm; TL 72 mm, comprising 16.1% of total length; HL 22.6 mm; maximum head width 15.1 mm; mass 53 g (preserved); rostral scute 3.6 mm wide and 3.8 mm high; nasals divided anterior and posterior to nostril; loreal single; 3/3 prefoveals; 1/1 subfoveals; 1/1 post-foveals; prelacunal contacting the second supralabial on the right side of the head, fused with it on the left side; 1/1 suboculars; 2/2 preoculars; 2/2 postoculars; 9/8 supralabials; 10/10 infralabials, first pair in contact posteriorly; mental longer than broad, contacting the first three infralabials on each side; five gulars between chin shields and first ventral; six rows of gulars separating first ventral from infralabials; three anterior internasals; 2/2 canthals; 5 posterior intercanthals; 6 intersupraoculars; 34 cephalic scales with no or feeble keels from mid level of the intersupraoculars to the tip of snout (Fig. 2); 25–25–19 dorsals; 177 ventrals; anal scute single; 57 subcaudals (proximal 54 divided and distal three undivided); five small scales on each side of the cloaca; tail spine three times as long as adjacent subcaudals, dorsal scales covering anterior half of tail spine.

Dorsal scales 2.5 times as long as wide anteriorly, becoming wider posteriorly, about 1.5 times as long as wide on tail; all dorsal scales strongly keeled; paraventral row of scales smooth to very weakly keeled
on posterior part of body, parasubcaudals noticeably keeled; paraventrals about twice as wide as adjacent dorsal scales; posterior cephalic scales strongly keeled and longer than wide; anterior cephalic scales rounded, smooth to weakly keeled; temporal scales keeled; internasals, canthals, and supraoculars smooth; scale row dorsal to supralabials weakly keeled.

Everted hemipenis subcylindrical, bilobed, extending to seventh subcaudal scale; bifurcation of sulcus spermaticus at level of first subcaudal; sulcus extending to tip of each lobe; bifurcation of lobes at level of second subcaudal scale; small to large ossified spines asymmetrically distributed on hemipenis extending from level of first subcaudal; largest spines about the same length as adjacent subcaudal scales; lobes covered with high retiform ridges forming papillate calyces (Fig. 3).

Dorsum of head (in preservative) brownish gray with diffuse dark olive-brown markings. A prominent dark olive-brown postorbital stripe extending from behind the eye to below the angle of the jaw, encroaching upon the posterior three supralabials on the right side of head and the posterior two scales on the left side; this stripe bordered dorsally by a diffuse pale brown zone. Canthal region and supralabials uniform gray. Iris grayish yellow with darker fecking. Body brown gray with a series of 14 large, pale gray-edged, dark olive-brown trapezoidal markings on each side, with their apices on the vertebral line; trapezoidal markings arranged opposite each other, or partly or completely juxtaposed; the pale borders of dark markings diffuse (Fig. 1). Tail dark brown dorsally. Venter pale yellowish gray with irregular brown blotching to fecking becoming more concentrated on tail.

Distribution.—Known only from Alcatrazes Island (1.35 km²), the largest of four small islands of Alcatrazes Archipelago (Fig. 1), approximately 35 km from the coast of São Paulo (Vanzolini, 1973), southeastern Brazil, with an elevational range of 3–266 m above sea level.

Natural history.—We found the new species active both on the ground (n = 6) and on low vegetation (n = 5) within the Atlantic forest covering Alcatrazes Island (semi-arboreal habits are characteristic within the B. jararaca group; see Martins et al., 2002); the holotype was found on the rocks of the wall of an old building (Fig. 1). Two individuals were resting by day, one within a decomposing palm trunk and the other under a fallen palm leaf. Of 12 prey found in the guts of B. alcatraz, nine were otostigmine centipedes (Ostostigmus sp.) and three were lizards (two introduced gekkonid lizards, Hemidactylus mabouia, and one scincid, Mabuya macrorhyncha). Centipedes and H. mabouia are common on the low portions of tree and palm trunks, as well as on the walls of old buildings. Most specimens of B. alcatraz were found under seabird (Stula leucogaster and Fregata magnificens) roosts on the canopy of the low forest, where large amounts of guano accumulate on the leaf litter (individuals of B. alcatraz are often found with bird droppings splashed over their body, Fig. 1). Cockroaches and centipedes (which probably prey on the former) are abundant on and around the guano. This is the only species of Bothrops known to feed mostly, if not exclusively, on ectothermic prey (Martins et al., 2001). This prey type and the venom properties of B. alcatraz probably are related, as a relationship was found between the diet and venom composition for some Bothrops species and/or ontogenetic phases (Andrade and Abe, 1999; Andrade et al., 1996; Furtado et al., 1991; M.F.D. Furtado, personal communication). Curiously, despite preying on lizards, neither juveniles (n = 3) nor adults have whitish or otherwise conspicuous tail tips, a feature present in all species of Bothrops known to prey on lizards or frogs, which are lured by the snake’s tail movements (Martins et al., 2001).

Other snake species recorded on Alcatrazes Island are two colubrids, Dipsas albifrons and Siphlophis pulcher, and an elapid, Micrurus corallinus, which also occur in the mainland Atlantic forest of southeastern Brazil (Peters and Orejas-Miranda, 1970). Species of Dipsas are arboreal but may forage on the ground and prey on slugs and snails. Siphlophis pulch-
er is arboreal and may also forage on the ground preying on lizards (including *M. macrorhyncha* and *H. mabouia*). *Micrurus corallinus* is fossorial and feeds on amphibiaenians and other elongate reptile prey (Marques and Sazima, 1997; Sazima, 1989; Sazima and Argoálo, 1994; personal observation). Thus, only *S. pulcher* overlaps with *B. alcatraz* in food requirements.

The smallest mature male (with opaque efferent ducts and enlarged testes) of *B. alcatraz* was 365 mm SVL and the smallest mature female (with oviductal embryos) was 477 mm SVL; males and females of *B. jararaca* attain sexual maturity at about 650 and 750 mm SVL, respectively (Jenneiro-Cinquini et al., 1993; Sazima, 1992). Thus, individuals of *Bothrops alcatraz* attain sexual maturity at a much smaller size than individuals of *B. jararaca*. A female of *B. alcatraz* collected in December contained one oviductal embryo and one atresic vitellogenic follicle. The embryo was fully-developed (SVL 130 mm, TL 27 mm). Another female collected in January contained two atresic vitellogenic follicles, apparently not ovulated. These data indicate that the period of juvenile recruitment in *B. alcatraz* may be similar to those of most species of *Bothrops*, in which parturition occurs generally between January and May (Almeida-Santos and Salomão, 2001; personal observation). Fecundity in *B. alcatraz* may be low due to its small body size, a trend recorded for several snake species (e.g., Shine, 1994). Another island species, *B. insularis*, also shows a low fecundity (litters of 2–10 and a high frequency of atresic eggs: Hoge et al., 1959).

**DISCUSSION**

Available data on the natural history of the three species of the *B. jararaca* group (see Sazima, 1992; Martins et al., 2001) suggest to us the following scenarios for diversification within this group. Two populations of a *B. jararaca*-like ancestor became isolated in the past (see below) on Queimada Grande and Alcatrazes islands. Small mammals, the main prey of adult *B. jararaca* (and of most *Bothrops*; Martins et al., 2001), do not presently occur on these islands and there is no evidence that they previously occurred there. Thus, from a semiarboreal, dietary generalist ancestor (Martins et al., 2001), two distinct evolutionary routes seem to have been taken by these two insular species. As a result of the absence of small mammals on the islands, adult *B. insularis* relied heavily on migrant passerine birds (approximately 85% of their current diet; Martins et al., 2001), and evolved a venom that kills birds more effectively (Amaral, 1921b; Cogo et al., 1993). On the other hand, adults of *B. alcatraz* retained two characters of juveniles, a diet based on ectothermic prey and one atresic vitellogenic follicle. The embryo was fully-developed (SVL 130 mm, TL 27 mm). Another female collected in January contained two atresic vitellogenic follicles, apparently not ovulated. These data indicate that the period of juvenile recruitment in *B. alcatraz* may be similar to those of most species of *Bothrops*, in which parturition occurs generally between January and May (Almeida-Santos and Salomão, 2001; personal observation). Fecundity in *B. alcatraz* may be low due to its small body size, a trend recorded for several snake species (e.g., Shine, 1994). Another island species, *B. insularis*, also shows a low fecundity (litters of 2–10 and a high frequency of atresic eggs: Hoge et al., 1959).

In general, resources on islands are in short supply, especially on small islands, and this may explain why mammals seldom colonize these isolated habitats (McNab, 1994). On the other hand, ectotherms require lower levels of resource use and several reptiles are successful island colonizers (e.g., Case, 1983; Hasegawa and Morigushi, 1989). Well known examples of successful island colonizers among pitvipers include four species of *Bothrops* in the Caribbean and in south-
eastern Brazil (Campbell and Lamar, 1989; Duarte et al., 1995; our study), Agkistrodon piscivorus in coastal Florida (Wharton, 1969), and several species of rattlesnakes (e.g., Case, 1983) in the New World, as well as Osophis okinatensis (Morigushi, 1989) and Gloydius sheddoensis (Jian-Li, 1995) in Asia. The generalist habits of most pitvipers (Greene, 1992; Martins et al., 2001) may have greatly facilitated the colonization of islands by species of Bothrops and other pitvipers.

Although body size among species of island snakes is highly variable (e.g., Case, 1983; Schwander, 1985), crotalines are generally smaller on islands (Case, 1983). Variation in body size in insular snakes may be a consequence of prey size and availability, as well as other factors such as presence or absence of predators and competitors (Case, 1983; Hasegawa and Morigushi, 1989; Kohno and Ota, 1991). Both insular species of the B. jararaca group are smaller than their mainland relative and have specialized diets. Competitors and predators are apparently absent or rare on both islands (see above). Thus, dwarfism in B. alcatraz (the smallest species in the B. jararaca group) may be related to the small size of its prey (centipedes and small lizards). On the other hand, B. insularis feeds mostly on relatively large prey (birds), and thus smaller size in this latter species may be related mostly to arboreal habits, as there seems to be an upper body size limit (around 1 m) for arboreality in Bothrops (Lillywhite and Smits, 1992).

The Alcatrazes lancehead is restricted to a small island off southeastern Brazil, where it is relatively common, although not as common as B. insularis on Queimada Grande Island (personal observation). A cliff portion of the Alcatrazes Island (Saco do Funil) has been used for target practice by cannons of the Brazilian Navy (F. P. de Campos, personal communication; personal observation). Should the practice continue, it would impose a threat for the Alcatrazes lancehead and other island endemics. Based on the information above, B. alcatraz is now included in the category Critically Endangered, criteria B1 (area of occupancy <10 km² and known from a single locality) and B2c (continuing decline observed in quality of habitat) of the IUCN Red List of Threatened Species (IUCN, 2000, www.redlist.org). Bothrops insularis of Queimada Grande Island is placed in the same category based on the same criteria (IUCN, 2000; see also Duarte et al., 1995), and the same may apply to several other island populations of Bothrops along the coast of southeastern Brazil, for which the taxonomic allocation remains uncertain. On the other hand, the coastal populations of B. jararaca are not under special threat at present, as most of the coastal Atlantic forest remnants in southeastern Brazil are included in protected areas (Kronka et al., 1993). Furthermore, B. jararaca is able to survive in disturbed habitats provided that some forest cover remains (Sazima, 1992).

RESUMO
Uma espécie nova de vipersídeo, Bothrops alcatraz, pertencente ao grupo jararaca, é descrita da Ilha de Alcatrazes, situada na costa de São Paulo no sudeste do Brasil. Esta espécie difere das populações continentais da costa do sudeste do Brasil pela coloração mais escura, menor tamanho, menor número de escamas ventrais, subcaudais e infra-labiais, número e forma das placas cefálicas anteriores e formato dos espínculos do hemipénis, além da intensa atividade coagulante e da presença de três proteínas específicas do veneno. A espécie nova difere de Bothrops insularis, outra espécie insular de jararaca do sudeste do Brasil, pelo padrão de coloração, menor tamanho, menor número de subcaudais em machos e ausência de hemiclítoris em fêmeas. Algumas características de B. alcatraz, como o tamanho pequeno do adulto, os olhos proporcionalmente grandes, a intensa atividade coagulante do veneno e a dieta composta por centopéias e lagartos, podem ser interpretadas como pedomórficas dentro do grupo jararaca. Sugemos aqui que o pequeno tamanho e as características do veneno de B. alcatraz estejam relacionados à sua dieta (semelhante à dos juvenis de B. jararaca do continente), o que pode ser resposta à difer-
ente disponibilidade de tipos de presas na Ilha de Alcatrazes (especialmente a ausência de pequenos mamíferos). Bothrops alcatraz e B. insularis podem ter se originado através do isolamento de populações ancestrais semelhantes a B. jararaca nas ilhas de Alcatrazes e Queimada Grande, respectivamente. A espécie nova é considerada como criticamente ameaçada devido a sua pequena área de ocorrência e o declínio da qualidade de habitat.

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APPENDIX I

Specimens Examined

Bothrops jararaca, Ubabuba (ZUEC 01051, 01052, 01057, 01058, 01247, 01445, 01600, 01601, 01602); Peruíbe, Estação Ecológica Jurá-Itatins (IB 57790, 57792, 57866, 57871, 57953, 58002, 58014, 58087); Ilha Grande, Estação Ecológica Jurá-Itatins (IB 57805, 57808, 57811, 57840, 57856, 57888, 57896, 57897, 57903, 57904, 57908, 57927, 57940, 57941, 57989, 58001, 58035, 58108, 58130, 58134, 58145).