ALEXANDRE INDRIUNAS

Revisão taxonômica de *Herpetacanthus* Nees (Acanthaceae)

Dissertação apresentada ao Instituto de Botânica da Secretaria do Meio Ambiente, como parte dos requisitos exigidos para a obtenção do título de MESTRE em BIODIVERSIDADE VEGETAL E MEIO AMBIENTE, na Área de Concentração de Plantas Vasculares em Análises Ambientais.

SÃO PAULO

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A minha mãe Helena, guerreira leonina,
dedico esse trabalho.(in memoriam)

"Another rather aberrant genus is Herpetacanthus, *[...] on account of the very unusual structure of the inflorescence it occupies a rather isolated position in this subtribe (Justiciinae)"*

Bremekamp 1965

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RESUMO

Revisão taxonômica do gênero *Herpetacanthus* Nees ex Moric. (Acanthaceae)

O gênero *Herpetacanthus* Nees ex Moric. reúne 18 espécies neotropicais, sendo 13 encontradas em Mata Atlântica do sul do Estado de São Paulo ao sul da Bahia; uma em Mata de Cipó no Estado da Bahia; duas na região amazônica (Brasil, Bolívia, Colômbia, Equador e Peru) e duas na América Central (Costa Rica, Honduras, Nicarágua e Panamá). *Herpetacanthus* atualmente está inserido na subfamília Acanthoideae, tribo Ruellieae, subtribo Justiciinae na classificação de Scotland & Vollesen, ou tribo Justiciae segundo McDade et al. O gênero compreende espécies subarbustivas a arbustivas, geralmente anisofílicas, sendo distinguida das demais Acanthaceae pelo cálice com cinco segmentos subiguais, corola bilabiada, geralmente com o lábio superior bilabiado e o inferior trilobado; quatro estames didínamos, os anteriores mais longo com anteras bitecas, as tecas inseridas em alturas diferentes do conectivo, e os posteriores mais curtos com anteras monotecas; espigas ou tirsos secundifloros com duas linhas adjacentes de brácteas férteis e duas de brácteas estéreis, onde as brácteas estéreis estão deslocadas de seus pares em direção ao ápice e horizontalmente mais próximas das brácteas férteis subsequentes, resultando em um arranjo peculiar; a cleistogamia é relativamente freqüente no gênero. O presente trabalho teve por objetivo a realização da revisão taxonômica de *Herpetacanthus*. O tratamento taxonômico foi baseado na análise de material herborizado proveniente de 27 herbários nacionais e internacionais, incluindo tipos nomenclaturais ou suas imagens digitalizadas, em observações no campo e acompanhamento de plantas cultivadas. O estudo resultou na descoberta de nove novas espécies, além da proposta de seis lectotipificações e uma neotipificação O trabalho é apresentado em dois capítulos correspondentes aos manuscritos tais quais serão submetidos para publicação, um sobre as novas espécies da Floresta Atlântica e o outro, uma sinopse para o gênero, com dados sobre a morfologia, chave de identificação para as espécies, descrições diagnósticas de cada uma delas, ilustrações, dados de distribuição geográfica, ecologia e fenologia, comentários taxonômicos e nomenclaturais.

Palavras-chave: Justiciinae, Justiciae, região neotropical

ABSTRACT

Taxonomic revision of *Herpetacanthus* Nees ex Moric. (Acanthaceae)

Herpetacanthus Nees ex Moric. comprises 18 neotropical species, 13 from the Atlantic forest from southern São Paulo State to southern Bahia State; one from a decidous forest (Mata de Cipó) in Bahia; two from Amazon (Brazil, Bolivia, Colombia, Ecuador and Peru); and two in Central America (Costa Rica, Honduras, Nicaragua e Panama). *Herpetacanthus* is classified in subfamily Acanthoideae, tribe Ruellieae, subtribe Justiciinae, in Scotland and Vollesen classification, or in tribe Justicia according to McDade et al. The species are subshrubs to shrubs, usually anisophylous, distinct from other Acanthaceae genera by calyx with five subequal segments, bilabiate corolla, usually the upper lip bidentate and lower lip trilobate; four didinamous stamens, the anterior ones longer with bithecous anthers, thecae inserted at different levels on the connective and the posterior ones shorter, monothecous; secundiflorous spikes or thyrsus with two adjacent rows of sterile bracts and two adjacent rows of fertile bracts, where the sterile bracts seems to be upward displaced from their pairs and laterally closer to the subsequent fertile bracts, resulting in a peculiar arrangement; cleistogamy is relatively common. The goal of this study is to revise taxonomicaly *Herpetacanthus*. The revision was based on herborized material from 27 herbaria, including nomenclatural types or digitalized images, field work and observation of cultivated plants. Nine new species were found and described, six lectotypifications and one neotypification are proposed. The dissertation is divided into two chapters, ready to be submitted for publication, one paper is about the new species, the other is a synopsis with data on morphology, identification key to the species, diagnose descriptions, illustrations, distribution, ecology, phenology, and comments on taxonomy and nomenclature

Key-words: Justiciinae, Justiciae, Neotropics

INTRODUÇÃO

Acanthaceae

A família Acanthaceae abrange cerca de 3500 espécies compreendidas em aproximadamente 200 gêneros distribuídas predominantemente nos trópicos, sendo também algumas espécies encontradas nas regiões temperadas (Cronquist 1981, Scotland & Vollesen 2000), tendo o Sudeste Asiático, Malásia, Índia, Madagascar, África Tropical, América Central, México, Andes e Brasil como regiões de maior concentração de espécies (Daniel 2000). No Brasil ocorrem 41 gêneros com 432 espécies (Profice *et al.* 2010), embora este número esteja subestimado.

A única obra que trata das espécies brasileiras de forma geral, é o trabalho de Nees von Esenbeck (1847a) na *Flora Brasiliensis*, publicado há mais de 160 anos. Esta obra conta com 343 descrições de espécies, muitas delas novas, distribuídas em 57 gêneros com 31 ilustrações, porém não há chaves de identificação para as espécies. Além disto, os conceitos genéricos e específicos utilizados eram bastante restritos, e as delimitações por ele propostas, sofreram várias alterações posteriores, sendo que boa parte dos gêneros foram sinonimizados. Antes desta obra, haviam sido publicadas apenas algumas espécies novas por Nees & Mart. (1823), Vellozo (1829) e Pohl (1831). Mesmo após a publicação da monografia de Nees (1847a) continuou-se publicando, por vários anos, apenas novos táxons. Entre os autores que mais descreveram novos táxons brasileiros nesta família pode se destacar Lindau (1895a, 1897, 1904, 1914, 1922) que, entre o final do século passado e começo deste, publicou mais de 80 espécies novas e Rizzini (1946, 1949, 1952) que, além de novos táxons, publicou chaves para gêneros e espécies brasileiros (Rizzini 1951, 1954).

Revisões taxonômicas mais recentes que incluem espécies que ocorrem no Brasil limitam-se à revisão do gênero *Aphelandra* R. Br. (Wasshausen 1975), sistemática do gênero *Pachystachys* Nees (Wasshausen 1986), revisão das espécies de *Mendoncia* Vell. Ex Vand. brasileiras (Profice 1988), ao estudo das *Ruellia* L. do Sul do Brasil, Argentina, Uruguai e Paraguai de (Ezcurra 1993), revisão de *Staurogyne* Wall. neotropicais (Braz 2005), revisão de *Lepidagathis* Willd. neotropicais (Kameyama

2008) e *Thyrsacanthus* Moric. (Cortês *et al.* 2010). Além de trabalhos que, embora tenham sido feito para países vizinhos, incluem espécies de ocorrência no Brasil como o tratamento de *Justicia* para Argentina, Paraguai e Uruguai (Ezcurra 1988) e Acanthaceae da Bolívia (Wasshausen & Wood, 2004). Os demais tratamentos são relativos à flora e flórulas regionais (Wasshausen & Smith 1969, Harvey & Wasshausen 1995, Kameyama 1995 2003 2006, Profice 1996 1997, Braz *et al.* 2002,.Vilar 2009).

Muito embora as Acanthaceae não possuam sinapomorfias morfológicas conhecidas (Simpson 2006, Judd 2009), os membros típicos da família são caracterizados por suas folhas decussadas, presença de ráfides e fibras aciculares no floema, cistólitos, cápsulas com deiscência explosiva nos quais as poucas sementes são sustentadas por uma estrutura ejetora derivada do funículo (retináculo) e sementes mais ou menos achatadas sem endosperma. Tradicionalmente a família é subdividida em quatro subfamílias: Acanthoideae, Nelsonioideae, Thunbergioideae e Mendonciaceae, definidas principalmente pela diferença na tipologia dos frutos e sementes (Hedrén *et al.* 1995). Estas diferenças morfológicas levaram os estudiosos do século XIX e início do século XX a propor diversos sistemas de classificação.

Dentre os sistemas de classificação anteriores aos estudos de filogenia baseados em dados moleculares propostos para Acanthaceae destacam-se os de Ness (1847b) que apresenta 11 tribos; Bentham (1876), cinco tribos, tendo estes autores utilizado características relativas aos tipos de frutos e pré-floração e presença de cistólitos para a delimitação dos níveis taxonômicos infra-familiares, seguidos de Lindau (1894), que por sua vez, divide em três subfamílias e posteriormente quatro subfamílias (Lindau 1895b) e Bremekamp (1965) apresenta três subfamílias, tendo a morfologia polínica forte influência nas circunscrições elaboradas pelos dois últimos autores.

Nos últimos anos diversos trabalhos confirmam o monofiletismo das Acanthaceae no senso seguido por Nees (1847b) e Lindau (1895) (Hedrén *et al.* 1995, Scotland *et al.* 1995, McDade & Moody 1999, McDade *et al.* 2000, Manktelow *et al.* 2001), e mais recentemente descobriu-se que o gênero *Avicennia* também deveria ser incluído em Acanthaceae (Schwarzbach & McDade 2002, McDade *et al.* 2005, 2008, Kiel *et al.* 2006, Daniel *et al.* 2008). Scotland & Vollesen (2000), reunindo dados moleculares, morfológicos e citogenéticos, propõem a divisão em três subfamílias: Nelsonioideae, Thunbergioideae e Acanthoideae, sendo a última constituída por duas tribos (Acantheae e Ruellieae), onde Ruellieae, por sua vez, é composta pelas subtribos Ruelliinae, Justiciinae, Andrographiinae e Barleriinae.

Nelsonioideae compreende sete gêneros, destacando-se *Staurogyne* Wall. com cerca de 140 das 160 espécies da subfamília, e possui como sinapomorfias morfológicas a pré-floração coclear descendente e a presença de seis a muitos óvulos. Pelo fato de possuírem frutos sem retináculo e as sementes com endosperma, o posicionamento das espécies do grupo tinha sido alvo de controvérsias, tendo Bremekamp (1965), por exemplo, transferido a subfamília para Scrophulariaceae (Scotland & Vollesen 2000).

Thunbergioideae, com cinco gêneros, aproximadamente 160 espécies, 90 do gênero *Thunbergia* Retz. e 60 em *Mendoncia* Vell ex Vand., compreende predominantemente lianas de cálice reduzido, e assim como os representantes de Nelsonioideae possuem frutos sem retináculo, porém suas sementes não apresentam endosperma. O posicionamento do gênero *Mendoncia* também foi controverso tendo sido tratado em uma subfamília própria, Mendoncioideae, por Lindau (1895) e elevado a família, como Mendonciaceae, por Bremekamp (1965) posicionamento seguido por outros autores como Cronquist (1981). Estudos moleculares posteriores a delimitação proposta por Scotland & Vollesen (2000) mostraram *Avicennia* L. como grupo irmão de Thunbergioideae, porém os ajustes taxonômicos necessários para definição do posicionamento deste gênero como pertencente a essa subfamília, ou em uma subfamília própria ainda aguardam estudos mais detalhados (Schwarzbach & McDade 2002, Borg *et al.* 2008, McDade *et al.* 2008).

Acanthoideae, por sua vez, compreende cerca de 95% das espécies da família, e é caracterizada pela presença do retináculo nos frutos. A divisão em tribos *sensu* Scotland & Vollesen engloba Acantheae que possui como sinapomorfias morfológicas os grãos de pólen sem endoaberturas e a presença de quatro anteras monotecas. Nela encontram-se aproximadamente 350 espécies, em mais de 20 gêneros, destacando-se: *Aphelandra* R. Br. (cerca de 175 espécies), *Acanthus* L. (30) e *Stenandrium* Nees (25).

A outra tribo, Ruellieae, inclui as espécies que possuem cistólitos (concrescências de carbonato de cálcio em rede celulósica), esta por sua vez é dividida em Andrographiinae (8 gêneros e 85 espécies) com destaque para os gêneros *Gymnostachyum* Nees (30 espécies) e *Andrographis* Wall. ex Nees (20), subtribo que possui como sinapomorfia o aumento do número de óvulos (seis a muitos); Barleriinae (9 gêneros e 400 espécies) incluindo *Barleria* L. (250) e *Lepidagathis* Willd. (100), subtribo que apresenta pré-floração quincuncial como sinapomorfia morfológica e, as duas maiores e mais representativas subtribos, Ruelliinae e Justiciinae, apontam como grupos irmãos, embora nenhuma sinapomorfia morfológica seja ainda conhecida para o

clado Ruelliinae + Justiciinae (McDade *et al.* 2008). Ruelliinae engloba mais de 800 espécies em cerca de 50 gêneros, destacando-se *Strobilanthes* Blume (250) *Ruellia* L. (150) e *Hemigraphis* Nees (90), Mantktelow (2000) aponta como sinapomorfias a pré-floração contorta e *filament curtain*, uma membrana que une as bases dos filetes. Compreendendo cerca de 2000 espécies e mais de 100 gêneros, entre eles *Justicia* L. (600 espécies) e *Dicliptera* Juss. (150), a subtribo Justiciinae é a maior e mais diversificada da família e apresenta como sinapomorfia morfológica a presença de grãos de pólen tricolporados hexapseudocolpados, embora com muitas subseqüentes mudanças para outros tipos polínicos (McDade *et al.* 2000, 2008, Scotland & Vollesen 2000).

McDade *et al.* (2000) em trabalho sobre as relações filogenéticas da tribo Justicieae *sensu* Bremekamp, equivalente, basicamente, à subtribo Justicineae de Scotland & Vollensen (2000), indicaram quatro linhagens principais: *Pseuderanthemum*, como grupo irmão das demais Justicieae,, Isoglossinae, como irmão dos outros dois clados, Justicióides e *Tetramerium*, e estes últimos irmãos um do outro. A monofilia do clado Isoglossinae + Justicioides + *Tetramerium* é fortemente sustentada, ao contrário da monofilia do clado *Pseuderanthemum*, que é apenas razoavelmente sustentada, existindo, portanto a possibilidade de que os gêneros aqui incluídos possam, na verdade, formar um grado basal.

Dentro da linhagem *Pseuderanthemum* há apenas um clado claramente monofilético, formado pelos gêneros *Chileranthemum* Oerst., *Odontonema* Nees, *Oplonia* Raf., *Ruspolia* Lindau e *Rutya* Harv. O posicionamento dos demais gêneros estudados, *Mackaya* Harv., *Asystasia* Blume, *Herpetacanthus* Nees ex Moric. e *Spatacanthus* Baill., permanece incerto, embora esteja claro seu posicionamento basal em Justiceae. Morfologicamente este grupo apresenta, ao contrário das demais Justicieae, quatro elementos no androceu, sejam quatro estames férteis ou dois estames e dois estaminódios, porém esta condição é hipotetizada com sinapomorfia para todas Lamiales, ou seja é plesiomórfica em Acanthaceae. Estes quatro gêneros basais de posicionamento ainda incerto são morfologicamente bastante distintos entre si, provavelmente pelo acúmulo de autoapomorfias, e bem delimitados morfologicamente.

O gênero *Herpetacanthus* Nees ex Moric.

Só a pouco a autoria de *Herpetacanthus* e, principalmente, a obra onde o protologo foi publicado teve subsídios para ser definida com clareza (Cortês *et al.* 2010), devido à falta de dados precisos sobre da data de publicação de uma obra de Moricand (1847) e a de Nees (1847a). Segundo Stafleau & Cowan (1993) a publicação do volume nove com a monografia da família, elaborada por Nees, data de 1 de junho de 1847, mesmo ano no qual Moricand teria lançado o nono volume de sua obra denominada *Plantes Nouvelles d'Amerique*, e segundo os autores, intervalo de publicação seria entre janeiro e junho de 1847 (Stafleau & Cowan 1981). Nesta obra, Moricand (1847) descreve cinco novas espécies de Acanthaceae, todas contendo diagnoses latinas, descrições detalhadas em francês, voucher das espécies e ilustrações, duas de gêneros anteriormente descritos, *Strobilorhachis blanchetiana* e *Dipteracanthus blanchetianus*; *Jacobinia lepida*, que conta com a descrição do gênero e as outras duas, *Herpetacanthus longiflorus* e *Thyrsacanthus ramosissimus*, então, poderiam ser consideradas como *descriptio genero-specifica* (McNeill et al. 2006), o próprio autor assinala que as novas espécies de Acanthaceae foram examinadas por Nees, que então elaborava a monografia da família, e que este teve a complacência de fazer as diagnoses (Moricand 1847). Na obra de Nees estas espécies são apontadas como sendo de autoria de Moricand, muito embora Nees se denomine autor dos gêneros *Jacobinia*, *Herpetacanthus* e *Thyrsacanthus* (Nees 1847a).

Cortês *et al.* (2010), em trabalho sobre o restabelecimento do gênero *Thyrsacanthus* Moric., elucidam a problemática da datação da obra de Moricand e conseqüente autoria dos gêneros nela publicados. Segundo informação obtida do *Conservatoire Botanique de La Ville de Genève* pelos autores, *Plantes Nouvelles d'Amerique* foi recebida como doação nesta instituição em março de 1847, tendo então prioridade sobre o volume nove da *Flora Brasiliensis,* segundo o Princípio III do Código Internacional de Nomenclatura Botânica (McNeill et al. 2006), no entanto como Moricand declarou na própria obra que as diagnoses foram feitas por Nees, para que houvesse harmonia com a monografia que o mesmo estava escrevendo, a autoria do gênero é de Nees.

A etimologia de *Herpetacanthus*, embora não explicitada por nenhum dos autores citados, é indicada como relativa à *herpeton* (réptil) supostamente a alguma

espécie rastejante (Barroso 1986, Rizzini 1947) ou simplesmente rastejante (Gledhill 2008).

A primeira espécie do gênero descrita é *Herpetacanthus longiflorus* Moric. relativa a coleta de Blanchet (3130 A) da Bahia (Moricand 1847) é posteriormente tratada por Nees (1847a) na *Flora Brasiliensis*, onde ainda inclui um material adicional coletado por Luschnath (s.n.) de Ilhéus, Bahia, juntamente com uma segunda variedade (β) *H. longiflorus* var. *brachystachyus* Nees por ele descrita a partir do material de Riedel da região da cidade do Rio de Janeiro.

Na *Flora Brasiliensis*, Nees (1847a) apresenta uma breve descrição do gênero e mais cinco espécies e uma variedade, além da supracitada. *Herpetacanthus* é então inserido na Tribo Gendarusseae, caracterizada pelos gêneros com dois ou raro quatro estames, lóculos das anteras paralelos ou divergentes, cápsula ungiculada, com quatro sementes. Na chave correspondente a Tribo, o autor prontamente separa o gênero por apresentar quatro estames didínamos férteis com os menores estames uniloculares e corola bilabiada.

Nees (1847a) caracteriza *Herpetacanthus* pelo cálice 5-partido, igual; corola bilabiada com o lábio superior reto bidentado e o inferior trífido; 4 estames didínamos unidos pela base, inseridos no ápice do tubo; anteras múticas, com os estames mais longos biloculares, com lóculos posicionados obliquamente, um acima do outro, estames menores uniloculares; estigma bilabiado curto; cápsula unida da base até o meio, estreita, sem semente, ou então 4 – 8 sementes; sementes sustentadas por retináculo. A inflorescência compõe-se de espigas simples ou variadamente compostas, bracteadas, subsecundas, de brácteas enfileiradas em quatro, unifloras e com bractéolas estreitas.

Na mesma obra, Nees (1847a) descreve além da citada variedade de *Herpetacanthus longiflorus*, cinco outras espécies e mais uma variedade: *H. rubiginosus*, *H. macahensis*, *H. macrophyllus*, *H. schultzii*, *H. melancholicus* var. *angustifolius* e *H. melancholicus* var. *latifolius*, espécies distribuídas do sul da Bahia ao sul de São Paulo.

Em De Candolle Prodromus Systematis Naturalis, Ness (1847b) mantém basicamente o mesmo tratamento anterior do gênero, acrescentando informações sobre os herbários onde estão depositados os materiais, e descrevendo uma nova espécie: *H. decipiens* Ness, relativa a uma coleta de Gardner para o Rio de Janeiro. Em seus estudos sobre a família, Bentham (1876) reavalia duas espécies das classificações anteriores

sinonimizando *H. decipiens* Nees em *Chamaeranthemum beyrichii* Nees e considerando *H. longiflorus* como uma espécie de *Lophostachys*.

Lindau (1894, 1895b) reposiciona *Herpetacanthus* na subfamília Isoglosseae, subtribo Isoglosinae. Posteriormente, Bremekamp (1938) em sua proposta de reestruturação da família posiciona o gênero na subfamília Odontonemeae, tribo Asystasiinae, incluindo mais duas espécies anteriormente descritas em *Juruasia* Lindau (1904): *H. acuminatus* (Lindau) Bremek.. (basiônimo: *J. acuminata* Lindau) e *H. rotundus* (Lindau) Bremek. (basiônimo: *J. rotundata* Lindau). Ambas as espécies são baseadas em coletas de Ule na região do Rio Juruá-Mirim (Juruá Miry), toponímia que dá origem ao nome do gênero. *H. rotundatus* é tratado na Flora da Bolívia (Wasshausen 2002, Wasshausen & Wood 2004) e *H. acuminatus* é citado para a Flora do Suriname (Bremekamp 1938).

Em 1942, Leonard descreve uma nova espécie para o gênero, *Herpetacanthus panamensis*, a primeira para a América Central, e em sua Flora do Panamá, Durkee (1978) sinomimiza em *H. panamensis*, outra espécie descrita por Leonard (1952), *Standleyacanthus costaricanus* Leonard, pertencente ao gênero monoespecífico, *Standleyacanthus* Leonard. Deste modo, *H. panamensis* é citado para o Panamá (McDade et al 2005, Durkee 1978), Costa Rica (Durkee 1986) e sua ocorrência registrada para Honduras (Daniel et al 2005) e Nicarágua (Durkee 2001)

No fim do século XX outra espécie endêmica da Costa Rica é descrita, *Herpetacanthus stenophyllus* Gómes-L. & Laurito (1991).

Deste modo, como atualmente compreendido, *Herpetacanthus* Nees ex Moric. é um gênero neotropical, com três áreas disjuntas de ocorrência: América Central, região amazônica e sudeste do Brasil, nas quais as 10 espécies e duas variedades, até então descritas, estão distribuídas.

Embora a monofilia de *Herpetacanthus* não tenha sido testada em análises filogenéticas e várias de suas características morfológicas sejam plesiomórficas em Justicieae (sensu Bremekamp), como a presença de quatro estames, cálice com cinco segmentos subiguais e grão de pólen tricolporado e hexapseudocolpado (McDade et al. 2008), *Herpetacanthus* é o único entre os gêneros basais analisados por McDade e colaboradores (2008) que apresenta a corola perfeitamente bilabiada e anteras com as tecas inseridas em alturas diferente no conectivo, além de uma inflorescência com morfologia única, características que são fortes indícios da monofilia do gênero.

O presente trabalho teve como objetivo realizar a revisão taxonômica do gênero *Herpetacanthus*, fornecendo dados para futuros estudos filogenéticos e fitogeográficos, além de elaboração de floras e listagens oficiais, visando à conservação.

Esta dissertação está sendo apresentada na forma de capítulos, uma vez que esses já estão no formato de publicação. No capítulo 1 são apresentadas novas espécies de *Herpetacanthus* Nees ex Moric. para a Mata Atlântica, artigo que será submetido a Systematic Botany. O capítulo 2, a ser submetido a Brittonia, refere-se ao tratamento taxonômico das espécies de *Herpetacanthus*; neste último capítulo há citações incompletas nos cabeçalhos taxonômicos das espécies e em algumas partes da introdução (indicadas por 20XX), visto que a referência completa depende da publicação do primeiro capítulo.

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CAPÍTULO 1 – NEW SPECIES OF HERPETACANTHUS (ACANTHACEAE) FROM EASTERN BRAZIL.

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Abstract−During the taxonomic review of *Herpetacanthus* (Acanthaceae) we found nine new species from the Atlantic forest in Brazil: *H. angustatus*, *H. chalarostachyus*, *H. delicatus*, *H. longipetiolatus*, *H. magnobracteolatus*, *H. neesianus*, *H. parvispica*, *H. pauciflorus* and *H. strogyloides*, which are here described and illustrated, geographical distribution, comments on its taxonomic affinities and a key to Atlantic forest species are also provided.
Keywords − Atlantic Forest, Justiciae, Justicineae, Neotropics

Herpetacanthus Nees is a Neotropical genus of subshrubs and shrubs, generally anisophyllous. It can be distinguished from other Neotropical Acanthaceae by the calyx with five subequal segments; corolla bilabiate with bidentate upper lip, and trilobed lower lip; four didinamous stamens, the anterior with bithecous anthers, the thecae inserted at different level on the connective, and the posterior with monothecous anthers; secundiflorous spikes or thyrsus with two adjacent rows of sterile bracts and two adjacent rows of fertile bracts, where the sterile bracts seems to be upward displaced from their pairs and laterally displaced toward the subsequent fertile bracts, resulting in a peculiar arrangement; these spikes or thyrsus can bear only chasmogamous flowers, rarely with only cleistogamous flowers or both types; sometimes the chasmogamous spikes become a thyrsus with cleistogamous flowers growing at the axil of the bracteole of a chasmogamous flower forming a monochasium with a older chasmogamous and one or two cleistogamous flowers. In a spike each flower is subtend by one fertile bract and two bracteoles, in a thyrsus each monochasium is subtend by a fertile bract, the first flower has two bracteoles and at the axil of one bracteole grow the second flower whose bracteoles (2^{nd} order) are, generally, much smaller than the first order bracteole.

According to McDade et al. (2000, 2008) *Herpetacanthus* is on the basal group of *Pseuderanthemum* that is a basal lineage in tribe Justiciae. Although *Herpetacanthus* share many plesiomorphic morphological characters as four stamens and tricolporate - hexapseudocolpate pollen grains and stipitate capsule with ellipsoidal head with four seeds, it differs from other genera of this lineage in having bilabiate corolla and its peculiar inflorescence.

The authorship, and especially the place of publication of the protologue of *Herpetacanthus* was controversial, it has been attributed to Nees (Durkee 1978, 1986; Wasshausen 2004; Scotland & Vollesen 2000; Tropicos) or to Moricand (International Plant Names Index; Farr & Zijlstra 1996+) due to the lack of evidence of the precise date of publication of Moricand's work *Plantes Nouvelles d'Amerique* (Moricand 1847), where a single species, *Herpetacanthus longiflorus* Moric., is described

Since no genus description was provided, this can be consider a *descriptio genero-specifica* (McNeill et al. 2006). It was not possible to know whether it was published before or later Nees' monograph of Acanthaceae in Martius' *Flora Brasiliensis* (Nees 1847a), where he provided the first genus description with six species and two varieties. But, recently Cortês et al. (2010) clarified the problem showing evidences that Moricand's publication is, at least, three months older than Nees'. Since Moricand clearly stated that Nees, who was simultaneously working on the monograph of Acanthaceae, examined all plants and did the diagnoses in order that the new taxa would be in harmony with Nees general work, the author, according to the Art. 46.2 of the International Code of Botanical Nomenclature (McNeill et al. 2006), is Nees and Moricand's book is the place of publication.

Until now only 10 species were recognized in the genus and they show disjunction distribution: six from the coastal Atlantic Rain Forest in eastern Brazil (Nees 1847a,b; Profice *et al.* 2010), two from northern South America in Amazon Forest (Lindau 1904; Bremekamp 1938; Profice *et al.* 2010; Wasshausen 1993; Wasshausen & Wood 2004), and two from Central America (Durke 1978, 1986; Gomez-Laurito & Grayum 1991; Daniel 2005). Here we describe nine new species in *Herpetacanthus* from eastern Brazil as part of the revision of the genus.

Material and Methods

Morphological studies were based on herbarium specimens from the following herbaria (those marked with an asterisk were visited by at least one of the authors specifically for this work): ESA*, FUEL*, GUA*, HBR*, HLP*, HRBC*, HUEFS*, IAC*, IAN*, INPA*, MBM*, MBML*, MG*, MO, NY, PMA, PMSP*, R*, RB*, SP*, SPF*, SPSF*, UEC*, UESC*, UNIP*, UPCB*, VIES*, from images of types of the follow herbaria: BR, F, G, GZU, K, W, and on field studies.

New species

Herpetacanthus angustatus Indriunas & Kameyama, sp. nov. – TYPE: BRAZIL. Espírito Santo: Santa Tereza, Valsugana Velha, 7 Mar 1986, Fernandes 1885 (holotype: MBML!; isotype: SP!, US!).

Herpetacantho nessiano Indriunas & Kameyama simillis sed praesertim foliorum laminis angusto-ellipticis, basibus decurrentibus apicibusque acutis (vs. laminis ovatis ad ellipticas basibus saepe angusto-decurrentibus apicibusque acutis ad acuminatis); inflorescentiis brevi-pedunculatis, ca. 0.5 cm longis (vs. 2–6 cm longis) differt.

Branched subshrub, (0.3–)0.5–1 m tall; stems terete to subquadrate, young stems with two longitudinal lines with reflexed eglandular trichomes ca. 0.5 mm, glabrescent, slightly anisophyllous. Leaves petiolate, blade narrowly elliptic, apex acute, base acute long decurrent, margins entire to inconspicuously undulate, discolor, abaxial side sometimes silvery, largest leaves of each node, petiole 0.3–0.5(–1) cm, blade (6–)8–11.5(–14.5) × (1.3–)1.7–2.7(–3) cm, the smallest ones, petiole 0.4–0.6(–1) cm, blade (3.3–)4–10.5(–13) × 1–2(–2.5) cm, 6 pairs of secondary veins, sparsely pubescent on the midrib, trichomes eglandular inflexed, glabrescent, sparsely ciliate. Inflorescence of one terminal and two axilary spikes on the distal node, sometimes also on lower nodes, spikes 1–6 flowers, 2.5–4 cm long, peduncle 2.5–5 mm long, tomentose to pilose, brownish eglandular trichomes; rachis tomentose, trichomes of the same type. Bracts subsessile, elliptic rarely ovate, apex acute to acuminate, base acute, pale green, white or white with purple apex, or purple, 13–17 × 8–10 mm, fertile bracts slightly smaller, pubescent, trichomes minute eglandular on the blade and glandular at the apex, ciliate, trichomes glandular and eglandular. Bracteoles lanceolate, ca. 5 × 0.5 mm, pubescent,

trichomes glandular and eglandular, minute, patente, sparsely ciliate, densely pilose and ciliate at the apex. Calyx segments lanceolate, ca. 4 × 0.5 mm, pubescente, ciliate. Corolla lilac or white pink-lined, ca. 22 mm long, tube ca. 12 mm long, throat 8 mm long, lateral lobes linear, 2 × 1 mm, central lobe acute, 2 × 2 mm, upper lip elliptic acuminate, 6 × 4 mm, externally puberulous, lobes ciliate. Anterior stamens ca. 5 mm long; posterior stamens ca. 4 mm; filaments sparsely glandular-pilose; Ovary ca. 1.4 mm, glabrous. Style 20 mm long, glabrescent. Capsule ca.1 × 0.2 cm, stipe 3–3.5 mm long, head elliptic 7–6.8 mm long, glabrous. Seeds ca. 2 × 1.5 mm, papillate. Figure 1.

***Etymology*—**The epithet refers to the narrow and acute leaves and corolla lower lips lobes.

Distribution and ecology—*Herpetacanthus angustatus* seems to have a very narrow distribution occurring only on the mountains and valleys surround the municipalities of Santa Tereza, Santo Antônio do Alto, and Santa Leopoldina, in the state of Espírito Santo. It grows on shade and wet places in understory of the rain forest about 700 m.

***Phenology*—**Mostly flowering from January to April, sometimes in September; fruiting in April.

Herpetacanthus angustatus resembles *H. neesianus* from which it is distinct by the leaves with narrowly elliptic blade, acute decurrent base and acute apex, and inflorescences with short peduncle up to 5 mm long, *H. neesianus* has ovate to elliptic blades, acute base often narrowly decurrent and acute to acuminate apex, and inflorescence peduncle 2–6 cm long.

***Additional Specimens Examined*—BRAZIL.** Espírito Santo: Santo Antônio, Terreno do Boza, 750, 9 Mar 1999, *Kollmann et al. 2050* (**SP**); Santa Tereza, Estação Biológica de São Lourenço, Caixa d'água, 6 Mar 2002, *Lorenzi 3210* (**HPL**); Estação Biológica de São Lourenço, divisa com João Romagna, trilha de mata primária, 20 Apr 2002, *Fontana et al 343* (**SP**); Bairro Centenário, Mata do Gilmar, 19º56'09" S, 40º36' W, 17 Mar 2006, *Kollmann et al. 8759* (**MBML, RB**); Mata do Tabajara, na trilha que acompanha o cano d'água, ao lado da cachoeira do Tabajara, 29 Jan 1997, *Hupp et al. 69* (MBML**, SP**), Mata do Bonfim., mata sobre o morro ao lado da BANESTES, 19º56'02" S, 40º35'22" W, 767 m, 3 Apr 2009, *Cardoso et al. 2466* (**HUEFS**); Santa Leopoldina, Rio Bonito, propriedade do Sr. Valdomiro Plaster, 20º03'81" S, 40º36'44" W, 615 m, 27 Jan 2007, *Fontana et al. 2738* (MBML, RB).

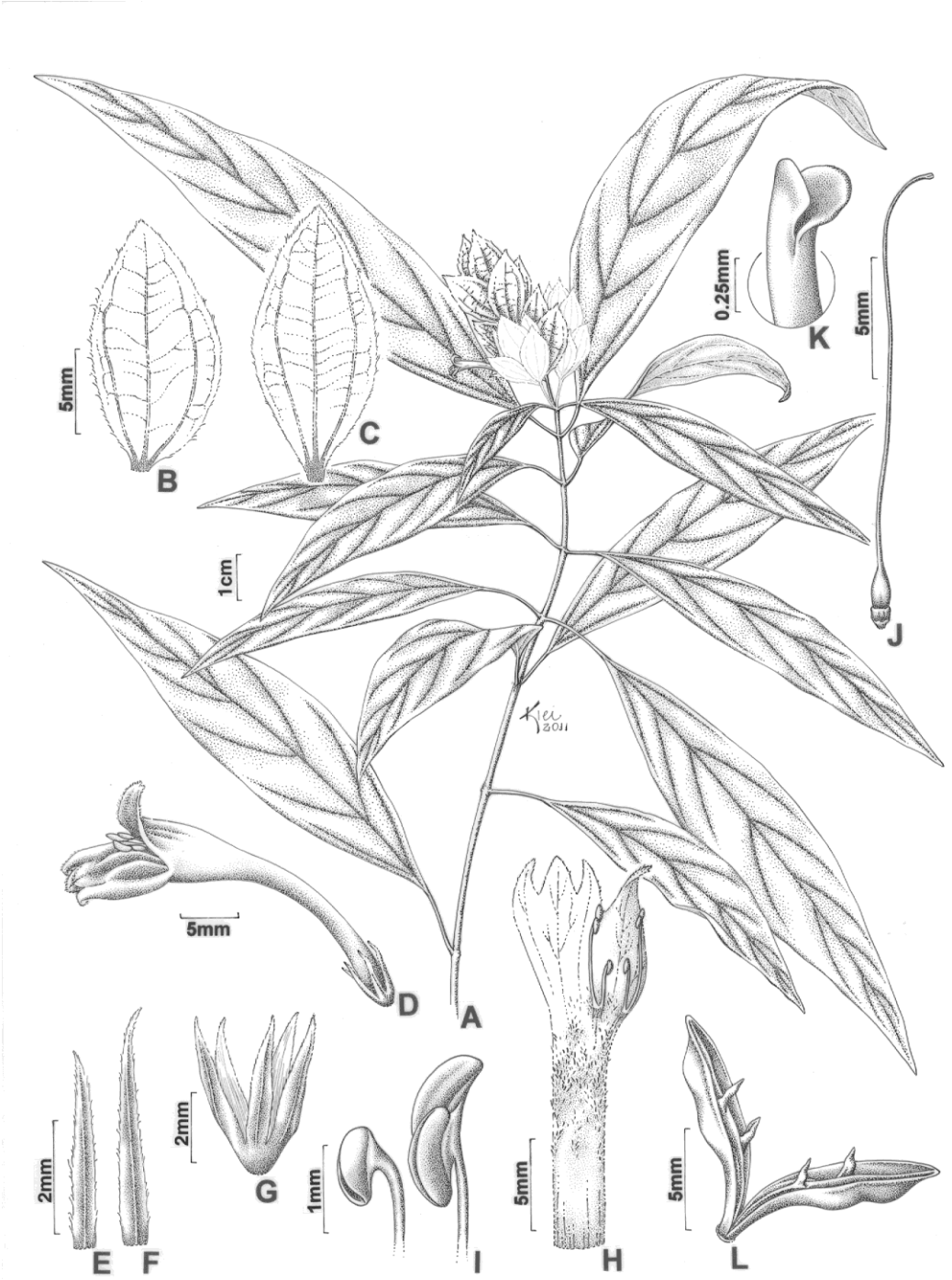

Fig. 1 – *Herpetacanthus angustatus* A. Flowering shoot. B. Fertile bract. C. Sterile bract. D. flower. E and F. Bracteoles. G. Calyx. H. Corolla split open. I. Anthers. J. Gynoecium. K. Stigma. L. Capsule without seeds. (A – C and L *Fontana & Brahim 2738*; D – K *Cardoso et al. 2466*)

Herpetacanthus chalarostachyus Indriunas & Kameyama, sp. nov. – **TYPE: BRAZIL.** São Paulo: Peruíbe, Estação Ecológica Juréia-Itatins, Núcleo Arpoador. Trilha do Morro Fernando, 23 Jun. 1994, *Melo, Cordeiro, Oliveira, Barros 1087* (holotype: SP!; isotype: NY!, SPSF!, US!).

Species habitu *H. rotundato* (Lindau) Bremek. praesertim bracteis rotundatis affinis, sed inflorescentiis saepe laxioribus et pedunculis longioribus differt, praeterae hic in São Paulo austro-occidentali rupertus, ille in Amazonia.

Herpetacantho tetrandro (Nees & Mart.) Herter habitu affinis sed follis ellipticis, glabris, (2.9–)4.5–10.9(–13)×(1–)2.3–5.5(–6.5) cm et bracteis rotundatis ad ovatas, sparse ciliatis (vs. foliis lato-ellipticis ad ovatas, tomentosis ad strigosis, 12–19.5 × 4.5–8 cm, et bracteis obovatis ad rotundatis, dense ciliatis) differt.

Erect to sprawling branched subshrub (0.2–)0.5–1 m tall; stems green to brownish, subquadrate to terete, glabrate, young stems with two longitudinal lines with reflexed eglandular trichomes ca. 0.5 mm long, mostly anisophyllous. Leaves petiolate, glabrescent, petiole with inflexed eglandular trichomes;, blade elliptic, apex acute to briefly acuminate, base acute, rarely slightly oblique, slightly discolor, the largest leaves of each node with petiole 0.5–0.6(–1.2) cm long, blade (4–)6.3–10.9(–13) × 2.9–4(–6.5) cm, the smallest leaves with petiole 0.3–0.6 mm, blade (2.9–)4.5–6(–7.5) × (1–)2.3–5.5 cm, 5(6) pairs of secondary veins, leaves subtending the inflorescence similar to the other leaves or with vinaceous veins, blade glabrous, minutely ciliate. Inflorescence mostly of one terminal and one axilary spikes on the distal node, sometimes one terminal and two axilary spikes on the distal node, rarely also on lower nodes, with only chasmogamous flowers, rarely with only cleistogamous flowers; the chasmogamous spike sometimes become a thyrsus with cleistogamous flowers growing at the axil of the bracteole of a chasmogamous flower forming a cyme with one chasmogamous and one or two cleistogamous flowers; spikes or thyrsus 1–5(–7) flowers, 1.7–4 cm long, peduncle 2–8(–10) cm long, glabrescent; rachis glabrescent, eglandular minute patent trichomes; chasmogamous spikes or thyrsus, bracts sessile to subsessile, pedicel ca. 1 mm, rounded to ovate, apex obtuse to acute, sometimes cuspidate, base obtuse to rounded, rarely subcordate, sometimes slightly oblique, pale green, usually with vinaceous veins, sometimes the entire surface, except the margins, becoming vinaceous, (10–)13–18(–20) × 5–10 mm, sparsely ciliate, with patent eglandular trichomes, fertile

bracts slightly smaller. Bracteoles linear-lanceolate, ca. 3 × 0.5 mm, 2nd order bracteole smaller, hirsute, eglandular minute patent trichomes. Cleistogamous spikes or thyrsus similar to chasmogamous ones, but bracts always green. Calyx segments lanceolate, ca. 4 × 1 mm, hirsute, eglandular minute patent trichomes, minutely ciliolate. Corolla white to pinkish, with purple or vinaceous macula, ca. 25 mm long, tube ca. 8 mm long, throat ca. 10 mm long, lower lip with lateral lobes triangular, apex obtuse, 4 × 3 mm, central lobe rounded, 3 × 6 mm, upper lip, largely lanceolate, 8 × 7 mm, ca. 1 mm, externally puberulous. Anterior stamens 5 mm long, thecae, 1–1.5 mm long; posterior stamens 3 mm long, thecae 1 mm; filaments sparsely glandular-pilose. Ovary 1.5 mm long, puberulent, patent eglandular trichomes. Style 19 mm long, sparsely glandular-pilose. Capsule 1–1.3 × 0.3cm, stipe 0.3–0.35 cm, head elliptic 0.68–0.7 cm long minutely pilose, patent or reflexed eglandular trichomes. Seeds ca. 2 × 1.5 mm, papillate. Figure 2.

***Etymology*—**The specific epithet means lax spike in Greek.

Distribution and ecology*—Herpetacanthus chalarostachyus* is endemic to the southeastern area of the state of São Paulo, Brazil, growing on understory close to watercourses, usually on populations of 20 to 30 individuals.

***Phenology*—**Flowering from February to June, fruiting from Mar to September.

Herpetacanthus chalarostachyus is similar to *H. tetrandrus* in habit, but differs in having glabrous and elliptic leaves, rounded to ovate and sparsely ciliate bracts. *Herpetacanthus tetrandrus* has tomentose to strigose, widely ellipitc to ovate leaves, obovate to rounded and densely ciliate bracts. *Herpetacanthus neesianus* Indriunas & Kameyama is also similar in habit, but differs by the inflorescence usually compound, rachis densely pilose to tomentose, and usually larger leaves.

Dried specimens of *Herpetacanthus chalarostachyus* are commonly brown and the bracts have shining surfaces.

Plants brought from the field and keeping in cultivation developed three kinds of inflorescences: the chasmogamous and cleistogamous spikes and the thyrsus on some specimens, probably common in nature.

***Additional Specimens Examined*—BRAZIL**. São Paulo: Itariri, Parque Núcleo Serramar, 24º17'22" S, 47º10'27" W, 4 May 1994, *Melo et al. 1014* (UEC, SP); Eldorado, Parque Estadual de Jacupiranga, Núcleo Caverna do Diabo, Trilha do Araçá, 24º38'22" S, 48º24'01" W, 400 m elev., 22 Mar 2005, *Oriani et al. 486* (ESA, UEC, SP); id., Núcleo Caverna do Diabo. Trilha da àgua Grande/Ressurgência, 24º37'50" S,

48º24'13" W, 25 Mar 2005, *Meireles et al. 223* (ESA, UEC, SP); id., Parque Estadual de Jacupiranga, Núcleo Caverna do Diabo, trilha da Cachoeira, 24º31'13" S, 48º06'29" W, 13 May 1996, *Franco et al. 1379* (SP); Juquiá, 34 km de Juquiá em direção a Tapiraí, 16 Feb 1995, *Souza. et al. 109* (SP); Peruíbe, 26 Mar 2001, *Lorenzi 2635* (HPL); id., Estação Ecológica Juréia-Itatins, Núcleo Arpoador, trilha do Fundão, subida do morro após o 1º riacho, 24º24' S, 47º01' W, 17 Sep 2010, *Indriunas et al. 41* (SP, SPSF); id., Trilha do Fundão. Descida do morro após o 2º riacho, 24º24' S, 47º01' W, 17 Sep 2010, *Indriunas 42 et al.* (SP, SPSF); id., trilha do Fundão. descida do morro após o 2º riacho, 24º24' S, 47º01' W, 17 Sep 2010, *Indriunas et al 43* (SP, SPSF); id., subida da Trilha do Arpoador para Parnapuã, 24º24' S, 47º00' W, 18 Sep 2010, *Indriunas 47* (SP, SPSF); alto da trilha para a praia do Arpoador, 24º23' S, 47º00' W, 18 Sep 2010, *Indriunas et al. 48* (SP, SPSF); id., trilha da Mangueira, após o riacho antes dos bambuzais, 24º23' S, 47º01' W, 18 Sep 2010, *Indriunas 49* (SP, SPSF); id., trilha da Mangueira, entre bambuzais, 24º23' S, 47º01' W, 18 Sep 2010, *Indriunas 50* (SP, SPSF); id., trilha da Mangueira, após bambuzais, 24º23' S, 47º01' W, 18 Sep 2010 *Indriunas et al. 51* (SP SPSF); id., trilha do Arpoador, 1 Mar 2000, *Oliveira et al.4* (SP); id, 24º23”18’S, 47º01”21’W, 20 Oct 2009, *Cordeiro et al.3139* (SP); id., trilha do Arpoador, 1 Mar 2000, *Oliveira et al.5* (SP); id., Reserva Ecológica Juréia-Guaraú, Morro do Guarauzinho, 30 Jul 1988, *Silva et al. s.n.* (SP), id., Reserva Ecológica Juréia-Guaraú, Praia do Arpoador, 1 Oct 1988, *Souza s.n.* (SP); id., Serra do Guaraú, região do Portal da Juréia (mirante), 24º20'30" S, 47º00'70" W, 23 Jun 2009, *Moura et al. 306* (SP, SPSF); id., Núcleo Guaraú, base do Morro Fernando, 24º22'01" S, 47º19'59" W, 25 Jan 2000, *Cordeiro et al. 1985* (SP).

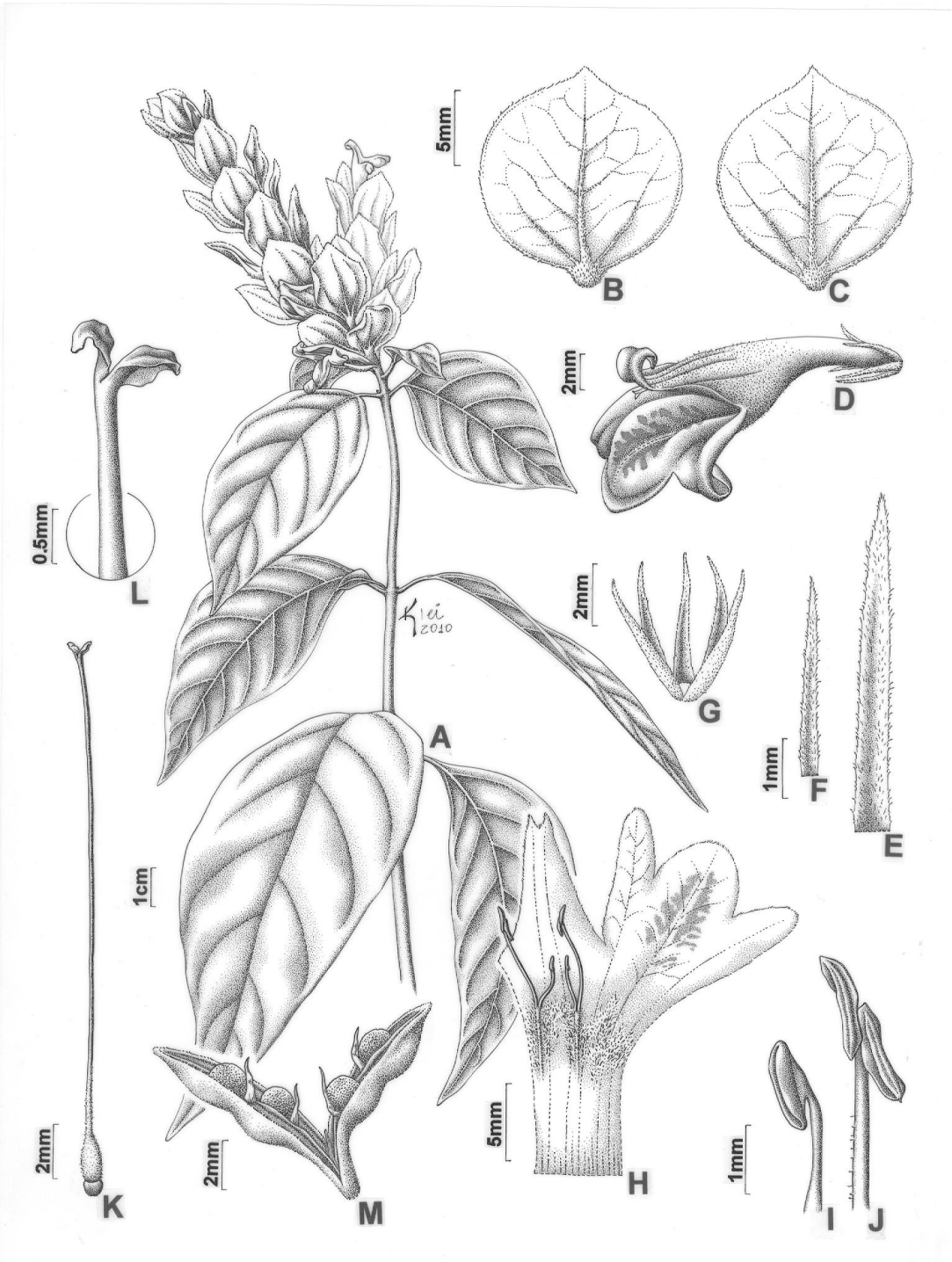

Fig. 2 – *Herpetacanthus chalarostachyus* A. Flowering shoot. B. Fertile bract. C. Sterile bract. D. flower. E and F. Bracteoles. G. Calyx. H. Corolla split open. I. Anther of posterior stamen. J. Anther of anterior stamen. K. Gynoecium. L. Stigma. M. Capsule with seeds. (*Cordeiro 3139*).

Herpetacanthus delicatus Indriunas & Kameyama, sp. nov. – TYPE: BRAZIL. Rio de Janeiro, Parque Nacional de Tijuca, Estado da Guanabara, Vertente Norte, do Parque Nacional de Tijuca, Grajaú, 150m, 14 Apr 1972, *Sucre & Soderston 8837* (holotype: SP!, isotype: RB! NY [photo]!).

Species affinis habitu *Herpetacantho melancholico* Nees & Mart. sed bracteis ciliatis cum bracteis sterilibus ellipicisque fertilibus oblanceolatis et foliorum laminis angusto-ellipticis, ca. 1 cm latis (vs. bracteis sparse ciliatis, lato-ellipticis ad rotundatas et foliorum laminis lanceolatis, ellipticis vel oblongis, ca. 4–10 cm latas) differt.

Branched subshrub, 20–30 cm; stems terete to subterete, glabrescent, young stems with two longitudinal lines with trichomes ca. 0.5 mm long, anisophyllous. Leaves petiolate, blade narrowly elliptic, apex acute to briefly acuminate, slightly mucronate, base acute, slightly asymmetric, discolor, membranaceous, densely ciliate at base and sparsely ciliate to the apex, the largest leaves of each node with petiole 0.3–1 cm long, blade 3.5–6.2 × 0.9–1.2 cm, smaller leaves with petiole 0.2–0.5 cm long, blade 2–3.5 × 0.7–1 cm, 5–6 pairs of secondary veins, leaves subtending the main inflorescence similar to the other leaves. Inflorescence generally of one terminal and one axilary spikes on the distal node; spikes 1–5 flowers, 1–3 cm long, peduncle 0.3–1 cm long, tomentose to pubescent; rachis pubescent. Bracts fertile mostly oblanceolate, sometimes elliptic, apex obtuse, briefly cuspidate, base cuneate, 7–10 × 2–4 mm, almost glabrate, sparsely ciliate, bracts sterile elliptic, apex obtuse, briefly cuspidate, base obtuse, 8–12 × 3.5–5.5 mm, almost glabrate, sparsely ciliate. Bracteoles lanceolate, ca. 2–3.5 × 0.25 mm, margin hirtellous. Calyx segments lanceolate, 2–3 × 0.25 mm, margins hirtellous. Corolla, white with vinaceous macula on the throat, ca. 13 mm long, tube 4 mm long, throat 5 mm long, lower lip with lateral lobes, ca. 1.8 × 1.5 mm, central lobe, 2.5 × 2 mm, upper lip, 4 × 2.5 mm, puberolous. Anterior stamens ca. 3 mm long, thecae ca. 1.5 mm long; posterior stamens ca. 2 mm, thecae ca. 1 mm; filaments sparsely pilose. Ovary ca. 1 mm long, glabrous. Capsule ca. 1 × 0.1 cm, stipe ca.4 mm, head ca. 6 mm. Seeds ca. 2 × 1.5 mm, papillate. Figure 3

***Etymology*—**The specific epithet refers to the delicate habit.

Distribution and ecology—*Herpetacanthus delicatus* is known only from an urban forest reserve (Parque Nacional da Tijuca) in the city of Rio de Janeiro. The most recent collection of *H. delicatus* is from 1972.

***Phenology*—**Flowering and fruiting in April.

Herpetacanthus delicatus resembles *H. melancholicus* by the similar habit, but it can be distinguished by the sparsely ciliate bracts, the sterile ones elliptic, and the fertile ones oblanceolate; leaves narrowly elliptic up to 2 cm wide. In *H. melancholicus* bracts are conspicuously ciliate, widely elliptic to rounded and the leaves ovate, elliptic or oblong, 4–10 cm wide.

***Additional Specimens Examined*—BRAZIL**. Rio de Janeiro: Rio Branco, Grajaú, 21 Apr 1946 *Emygdio 451* (**R**); 28 Apr 1946, *Emygdio 464* (**R**).

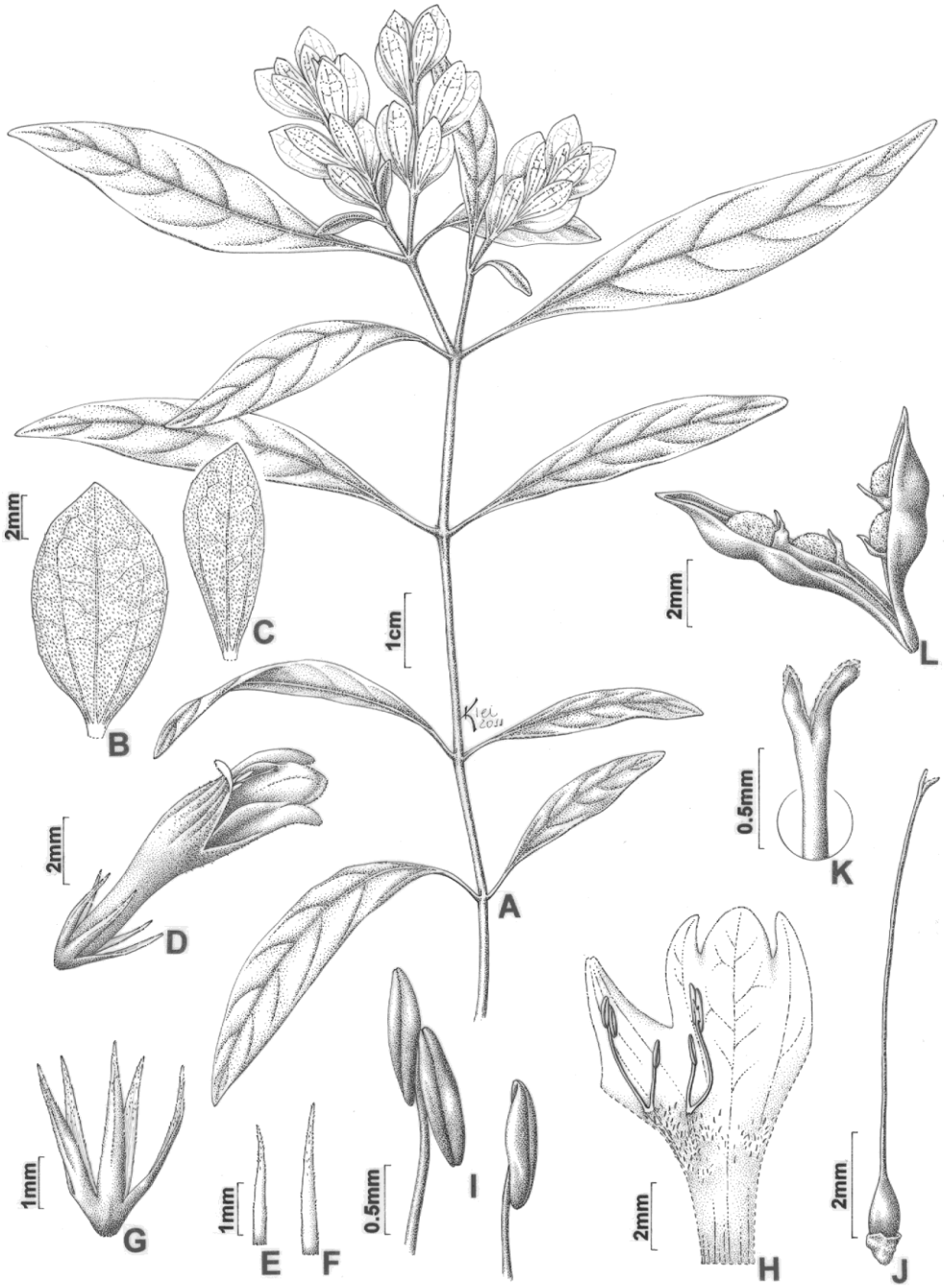

Fig. 3 – *Herpetacanthus delicatus* A. Flowering shoot. B. Sterile bract. C. Fertile bract. D. flower. E and F. Bracteoles. G. Calyx. H. Corolla split open. I. Anthers. J. Gynoecium. K. Stigma. L. Capsule with seeds. (*Emygdio 451*).

Herpetacanthus longipetiolatus Indriunas & Kameyama, sp. nov. – TYPE: BRAZIL. Espírito Santo, Município de Águia Branca, Águas Claras. Zequinha, alt.: 350-450 m/s.m. 18º52'32"S e 40º48'52"W, 15 Aug 2007, *Vervloet, Demuer, Bause & Cruz 3174* (holotype: MBML!; isotype: RB!).

Species insignis ab omnibus speciebus notis generis foliis longipetiolatis (petiolio fere tam longis quam lamina) differt.

Erect subshrub, ca. 0.5 m tall; stems pale green, hexagonal to subquadrate or furrowed, puberulous, young stems with two longitudinal lines with reflexed eglandular trichomes ca. 0.5 mm, anisophyllous. Leaves long petiolate; blade ovate, apex acute to briefly acuminate, base obtuse, abruptly shortly decurrent, oblique, slightly discolor, the largest leaves of each node with petiole ca. 5.5 cm long, blade 8.5(–9) × 4.2(–5.5) cm, the smallest ones with petiole ca. 4.5 cm long, blade (2.2–)4.5 × 3.2 cm, 5–6 pairs of secondary veins; leaves subtending the inflorescence similar to the other leaves, petiole abaxially pubescent, adaxially tomentose, trichomes glandular and eglandular, blade with both surfaces glabrescent, with inflexed eglandular trichomes, ciliate, trichomes glandular and eglandular. Inflorescence of one terminal and one axilary spikes on distal nodes; spike 1–5 flowers, 2–4 cm long, peduncle ca. 0.5 cm long, tomentose, glandular and eglandular minute patent trichomes. Bracts green, sessile to subsessile, pedicel ca. 1mm, ciliate, with patent glandular and eglandular trichomes of two different sizes, ca. 0.3–1 mm, blade pubescent with the same type of trichomes; fertile bracts widely elliptic, apex acute to acuminate, base acute, oblique, ca. 10–15 × 5–8 mm, pubescent, minute patent eglandular and sparsely glandular trichomes on both surfaces; sterile bracts widely elliptic, apex obtuse acuminate, base obtuse to rounded, oblique, 15–18 × 11–15 mm. Bracteoles linear, ca. 3–6 × 0.5 mm, hirsute on both surfaces, trichomes glandular and eglandular, minute, patent. Calyx segments linear lanceolate, hirsute on both faces, eglandular minute patent trichomes, ca. 4.5 × 0.5 mm, ciliate. Corolla white, pink-lined, externally puberulous, ca. 15 mm long, tube 5 mm long, throat 5 mm long, lower lip with lateral lobes triangular, apex obtuse to acute, 2 × 2 mm, central lobe rounded, 2.5 × 3 mm, upper lip widely-lanceolate, ca. 5 × 4 mm. Anterior stamens 4 mm long, thecae ca. 1.5 mm long; posterior stamens 3 mm, thecae ca. 1 mm; filaments sparsely glandular-pilose. Ovary glabrous. Style 15 mm long, sparsely pilose at the base. Capsule ca. 1 × 0.2 cm, stipe 0.3 cm long, head elliptic 0.7 cm long, pubescent, trichomes patent or reflexed eglandular. Seeds ca. 2 × 1.5 mm, papillate. Figure 4.

***Etymology*—**The specific epithet means long petiolate.

Distribution and ecology*—Herpetacanthus longipetiolatus* is known only from a single collection from Águia Branca, in the state of Espírito Santo, Brazil. Elevation 350-450 m.

***Phenology*—**flowering in August.

Herpetacanthus longipetiolatus is easily recognized by its long petiolate leaves (almost as long as the blade) that are unique in the genus. Its prominently anisophyllous leaves with conspicuously asymmetric base and ciliate margin are other remarkable diagnostic characters.

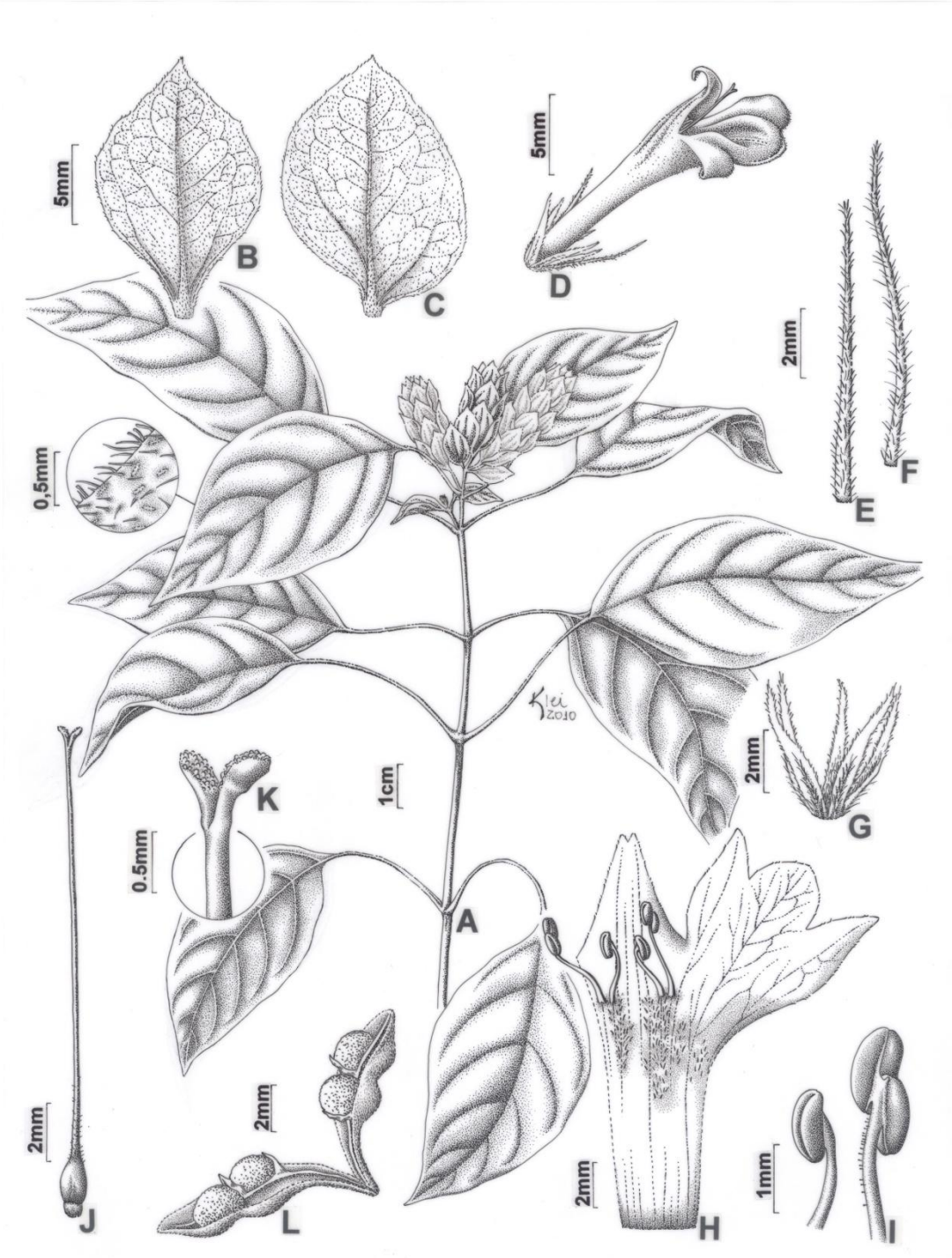

Fig. 4 – *Herpetacanthus longipetiolatus* A. Flowering shoot. B. Fertile bract. C. Sterile bract. D. flower with bracteoles. E and F. Bracteoles. G. Calyx. H. Corolla split open. I. Anthers. J. Gynoecium. K. Stigma. L. Capsule with seeds. (*Vervloet et al. 3174*)

Herpetacanthus magnobracteolatus Indriunas & Kameyama, sp. nov. – **TYPE: BRAZIL. Bahia: Jequié** Serra do Brejo, Fazenda do Sr. Francisco Brito, 12º15'22" S, 39º05'58" W, 7 Sep. 2008, *Côrtes, Ribeiro, Ribeiro 116* (holotype: **HUEFS**).

Species insignis ab omnibus speciebus notis generis bracteolis ellipticis accrescentibus 1/4 ad 3/4 bractearum attingentibus differt. *Herpetacanthus magnobracteolatus* simillis *H. melacholico* Ness et Mart. habitu et aspectu foliorum sed bracteis bracteolisque elliptico-ovalibus (vs. bracteis rotundatis et bracteolis lineari-laceolatis ad lanceolatas) differt.

Branched subshrub, 0.5–1.0 m tall; stems terete, green, young stems with two longitudinal lines with inflexed eglandular trichomes ca. 0.5 mm long, glabrescent, anisophyllous. Leaves petiolate, elliptic to ovate, rare oblong, apex acute to briefly acuminate, mucronulate, base acute to cuneate, sometimes obtuse or decurrent, slightly oblique, blade slightly discolor, membranaceous to chartaceous, glabrous, sometimes upper surface hirsute along the midrib, inconspicuously ciliate, the largest leaves of each node with petiole 0.3–0.6(–0.8) cm long, blade 4–8(–9.5) × 1.6–4.5 cm, the smallest ones with petiole 0.3–0.7 mm long, blade 1.7–5.5(–7) × 1–3 cm, leaves subtending the main inflorescence similar to the other leaves. Inflorescence generally a single terminal spike, rarely with axillary spikes at distal nodes; spikes 1–5 flowers, 2–4 cm long, peduncle 0.3–0.5 cm long, glabrescent; rachis glabrescent. Bracts fertile and sterile similar, sessile to subsessile, pedicel ca. 0.8 mm, imbricate, elliptic to ovate, apex acute, base obtuse, pale green, green with pinkish margin or purplish; (10–)13–20 × 8–10 mm, glabrescent, with minute eglandular trichomes on the midrib, ciliate, with eglandular trichomes, 0.2–0.5(0.8) mm. Bracteoles elliptic, apex abruptly acuminate, (6–)1–1.5 × 0.2–0.6 mm, glabrescent, sometimes with sparse minute trichomes on the midrib, ciliate, trichomes eglandular ca. 0.5 mm. Calyx segments lanceolate, ca. 5.5 × 0.5 mm, hirsute, eglandular minute patent trichomes, ciliate. Corolla white to creamy white, tinged magenta distally, lilac macula at lobes base, puberulous, ca. 1.3 cm long, tube 6 mm long, throat 1.5 cm long, lower lip with lateral lobes acute, 5 × 3.5 mm, central lobe 5 × 4 mm, upper lip largely lanceolate, 8 × 7 mm. Anterior stamens 2 mm long, posterior stamens 1 mm. Ovary glabrous. Style glabrous, ca. 7 mm long. Capsule 0.8–1.2 × ca. 0.3 cm, stipe 0.2–0.4 cm long, head elliptic 0.6–0.8 cm long, glabrous. Seeds ca. 2.5 × 2 mm, papillate. Figure 5.

***Etymology*—**The specific epithet means large bracteolate

Distribution and ecology—*Herpetacanthus magnobracteolatus* is the only species from eastern Brazil that occurs in a moist deciduous forest (Mata de Cipó), with rainfall between 800–1000 mm/year and a well-defined rainy and dry period (Thomas 2003). This kind of vegetation is considered a transition between the wet Atlantic Forest dominium nd the Caatinga, a drier forest. It grows in the understory.

***Phenology*—**Flowering in September, fruits from April to September.

Herpetacanthus magnobracteolatus can be recognized by the elliptic acrescent bracteoles that grow up to ¾ of bract size during fruit development. The leaves are somewhat chartaceous, stiffer than the leaves of other species. Information about the corolla was supplied by Côrtes (unpubl. data), because there was only a fragment in the material examined.

***Additional Specimens Examined*—BRAZIL**. Bahia: Maracás, Fazenda dos Pássaros. BA 250 (=BA 554 na carta ao milionésimo), a 24 km a E de Maracás, 900 m elev., 13 Jul 1979, *Mori & King 12181* (**RB**); id., ca. de 6-8 km da cidade, na estrada do Cruzeiro, 13º23'48" S, 40º21'54" W, 1002 m elev., 23 Apr 2002, *Souza et al. 198* (**HUEFS**); Jequié, Serra do Brejo, Fazenda of Francisco Brito, 10.5 km S of Mandacara on road to Serra do Brejo (road that goes past stadium), 13º56'49" S, 40º06'40" W, 600-700 m elev. 26 Jul 2003, *Thomas et al. 13602* (**SPF**).

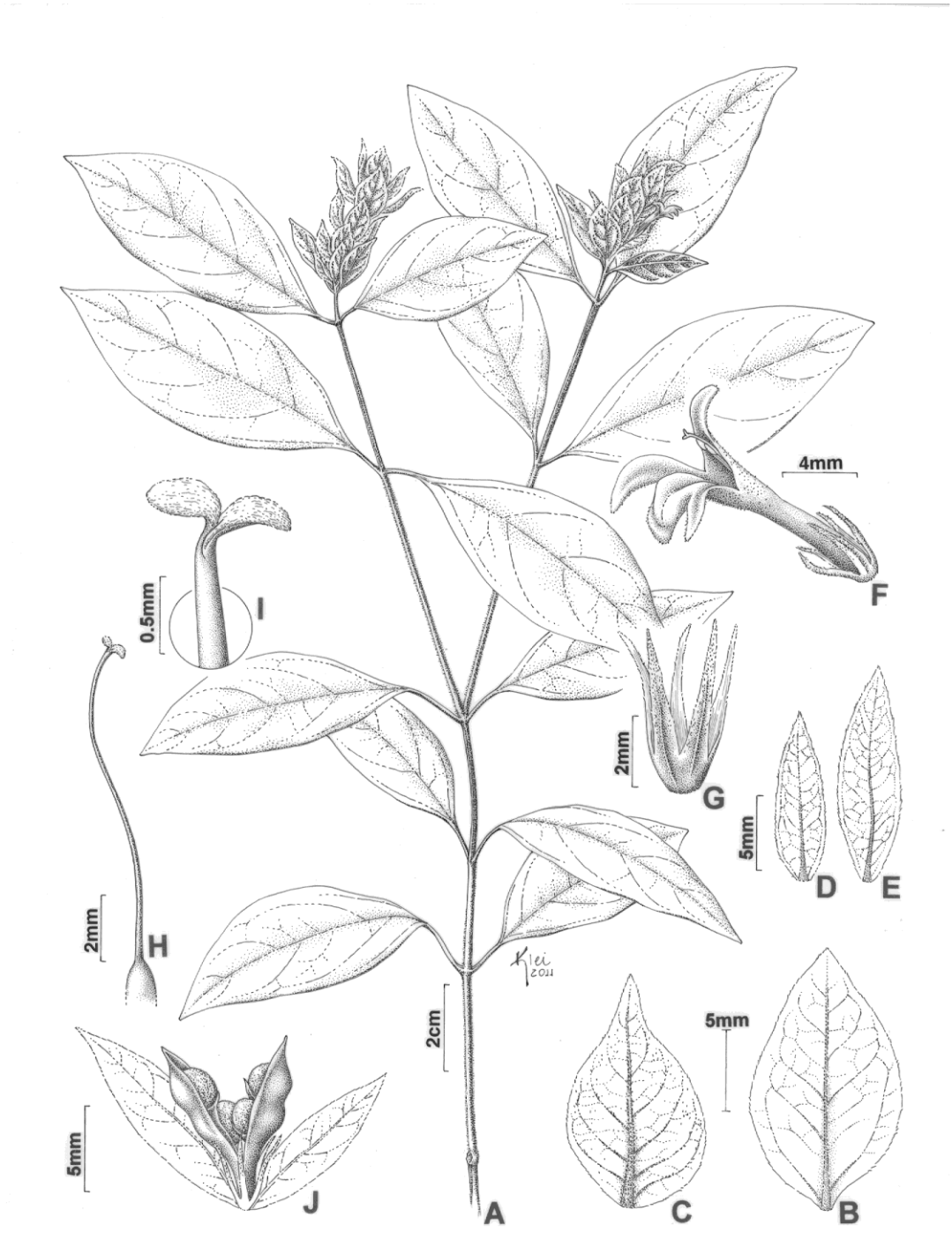

Fig. 5 – *Herpetacanthus magnobracteolatus* A. Flowering shoot. B. Sterile bract. C. Fertile bract. D and E. Bracteoles. F. Flower. G. Calyx. H. Gynoecium. I. Stigma. J. Fruit, seeds calyx and bracteoles. (A, F (photo) – I *Côrtes et al. 116*; B – E, J *Mori & King s.n.*)

Herpetacanthus neesianus Indriunas & Kameyama, sp. nov. – TYPE: BRAZIL. Rio de Janeiro, Área de Proteção Ambiental Cairuçu, Trilha para a pedra rolada, 300m, 28 Jun 1995 *Bovini, Marques, Marquete, et al. 833* (holotype: **SP!**; isotype: RB!).

Herpetacantho longifloro Moric. longis corollis affinis sed bracteolis minoribus, ca. 1 cm longis, paulo pilosis et corollis faucibus latioribus (vs. bracteolis maioribus , ca. 1.5 cm longis, pilosis et corollis faucibus angustis) differt.

Erect branched subshrub, (0.3–)0.5–1(–1.5) m tall. Stems green, terete, young stems usually with two longitudinal lines with reflexed eglandular trichomes ca. 0.5 mm long, puberulous to glabrescent, usually anisophyllous. Leaves often discolor, membranaceous to chartaceous, petiole glabrous or sparsely pilose, blade ovate to elliptic, apex acute to acuminate, base acute, usually long narrowly decurrent, rarely slightly oblique, inconspicuous glabrescent, commonly with some sparsely trichomes at the base of the midrib, ciliate, minute appressed eglandular trichomes, (4–)6–8(–9) pairs of secondary veins; the largest leaves of each node with petiole (0.3–) 0.5–0.8 (–2.2) cm long, blade (5.2–)8–18 (–21) × (2.2–)2.5– 6(–7.3) cm, smallest leaves with petiole (0.2–)0.3-1(–1.5) cm long, blade (3.1–)5–17(–19.5) × (0.9–)1.5–5.5 (–7) cm. Inflorescence of one terminal and two axillary spikes or thyrsus on distal nodes, sometimes with 2nd order branching, rarely 3rd order, spikes (2–)4–10(–12) flowers, 2–8 cm long, peduncle 2–6 cm long, densely pilose to tomentose, rachis puberulous to pubescent. Bracts sessile to subsessile, pale green, whitish to white, rarely pinkish, sometimes with a vinaceous macula, membranous, elliptic, narrowly elliptic to rounded, ovate or obovate (specially the upper ones), apex acute, acuminate to abruptly acuminate, base obtuse to rounded, 1.3–2.5 × 0.8–1.7 cm, sterile bracts usually smaller, glabrescent, with sparsely trichomes along the veins, ciliate, with different sizes of eglandular trichomes up to 1mm, and rarely with minute glandular trichomes. Bracteoles linear-lanceolate, ca. 5–10 × 0.3–0.5 mm, glabrescent, ciliate with trichomes ca. 1 mm long, 2nd order bracteoles much smaller. Calyx segments lanceolate, ca. 5 × 0.5(–0.7) mm, glabrescent, ciliate, trichomes minute, apex sometimes tomentose. Corolla purple to whitish, sometimes pinkish inside, sparsely pilose, ca. 3 cm long, tube ca. 1.5 cm long, throat 0.9 cm long, lower lip with lateral lobes apex rounded, 2.5 × 1.5 mm, central lobe 3 × 4 mm, upper lip, largely lanceolate, apex obtuse, 5 × 2.5 mm. Anterior stamens ca. 7 mm long, upper thecae ca. 1.5 mm long, lower ones 1 mm long; posterior stamens 5 mm, thecae 1 mm; filaments glabrous. Ovary 1.5 × 0.5 mm, glabrescent, style ca. 4 cm long, glabrous.

Capsule ca. 1.5 × 0.2 cm, stipe 0.5 cm long, head elliptic, ca. 1 cm long, glabrous, except for minute trichomes sometimes at the apex. Seeds ca. 2.5 × 2–2.5 mm, papillate. Figure 6.

Etymology—The specific epithet honours Christian Gottfried Daniel Nees von Esenbeck (1776-1858) for his important contribution on Acanthaceae studies and the autor of the genus *Herpetacanthus*.

Distribution and ecology—*Herpetacanthus neesianus* occurs from northeastern São Paulo to Rio de Janeiro States, some specimens from Minas Gerais State also were found. It grows in the understory of well-preserved or disturbed areas.

Phenology—flowering from March to November, fruiting mostly from June to August.

Herpetacanthus neesianus resembles *H. longiflorus*, that occurs in the state of Bahia, in having long corolla, they can be distinguished by the shorter, sparsely pilose bracteoles up to 1 cm long and corolla with a well distinct and wider throat area, *H. longiflorus* has longer, ca. 1.5 cm, and pilose bracteoles, narrower and almost undistinguishable throat area, i.e., the basal tube and the throat have almost the same width. It is possible that *Herpetacanthus neesianus* is *H. longiflorus* var. *brachystachyus* Nees, but there is not enough information in the original description to confirm it and the holotype (Riedel 794, from Rio de Janeiro), cited to Herbarium LE (Nees 1847b) is lost, according to the curator Mr. Ivan Tatanov (pers. comm.) and no duplicates were found. Many specimens of *H. neesianus* were determined as *H. melancholicus* .

***Additional Specimens Examined*—BRAZIL**. Minas Gerais: São José do Batatal, Tombos do Carangola, Jul 1888, *Schwacke s.n.* (**R**); São Paulo de Muriaé (old name of Muriaé), Jul 1880, *Mello Neto s.n.* (**R**); Muriáe, Área de inundação da Usina Hidroelétrica de Cachoeira Encoberta, ás margens do Rio Glória, 18 Apr 1998, *Salino et al. 4185* (**US**); Rio de Janeiro: Santa Maria Madalena, Tamborim, March 1937, *Lima 48* (RB, **SP**); id., beira da Rodovia RJ 182, da fonte de Visconde do Imbé para Conceição de Macabu, 22º02'42" S, 41º58'24" W, 423 m elev., 22 Jun 2005, *Lorenzi et al. 5446* (**IAC**); id., 12 May 2007, *Lorenzi 6255* (**HPL**); Magé, 28 Aug 1982, *Guedes 163* (RB, **SP**); id., 11 Jun 1983, *Guedes et al. 271* (**RB**); id., 10 Jul 1983, *Guedes 297* (**RB**); id., 6 Aug 1983, *Guedes et al. 322* (RB, **SP**); Serra dos Órgãos, barreira do Soberbo, 14 Jun 1946, *Araújo s.n.* (**RB**); id., Barreira-Fagundes, 12 Aug 1948, *Pereira 605* (HRB, RB, **US**); Guapimirim, Granja Monte Olivete, margem do Rio Bananal, 22º32'14" S,

42º58'55" W, 350-400 m elev., 18 Aug. 1993, *Braga 510* (**RB**); Itatiaia, Lote 17, 22º29'46" S, 44º33'47" W, 900 m elev., May 1950, *Brade et al. 20337* (**RB**); Paraty, Morro da Pedra Solada, dentro da mata, próximo ao bambuzal, depois do córrego, 23º18'50" S, 44º44'30" W, 148 m elev., 8 Jun 2005, *Silva-Castro et al. 1016* (**HUEFS**); id., Morro da Pedra Rolada, 180 m elev., 8 Mar 1994, *Ribeiro et al. 06* (**RB**); id., Área de Proteção Ambiental Cairuçu, terrestre às margens da trilha, 260 m elev., 11 May 1991, *Sylvestre et al. 523* (**RB**); id., id., trilha para o Morro da Pedra Rolada, 180 m elev., 28 Jun 1995, *Boruche 10 et al.* (RB, **SP**); id., id., estrada de Laranjeiras para a Praia do Sono, 12 May 1991, *Sylvestre et al. 544* (**RB**); id., id., Morro do Córrego dos Micos, 160 m elev., 26 Nov 1994, *Giordano et al. 1797.* (RB, **SP**); id., cerca 16 km do Trevo de Parati, entrada à direita da BR 101, antes da ponte, mata próxima ao Córrego dos Micos, 23º13'04" S, 44º42'46" W, 90-500 m elev., 1 Jul 1993, *Konno et al. 213* (**RB, SP**); id., Morro do Carrapato, 250 m elev., 30 Aug 1994, *Bovini et al. 529* (**RB**); id., Estrada proxima ao Rio dos Meros, beira da Mata, 23º13'04" S, 44º42'46" W, 70 m elev., 10 May 1994, *Marquete 1771* (**SP**); id., Ponta Negra. Caminho para a Praia dos Antigos, ao longo da trilha, 8 Jun 1994, *Reis 181* (**SP**); id., Fazenda Paraty Mirim, Propriedade da Flumitur, 29 Jun 1977, *Almeida et al. 264* (RB, **SP**); São Paulo: Caraguatatuba, Parque Estadual da Serra do Mar, Núcleo Caraguatatuba. Trilha da Poção, é muito comum nas trilhas da Mococa e do Tropeiro, 23º37'14" S, 45º24'47" W, 9 Sep 2000, *Bianchini 1457 et al.* (SP, **SPSF**).

Fig. 6 – *Herpetacanthus neesianus* A. Flowering shoot. B. Pilosity detail of the leave. C. Fertile bract. D. Sterile bract. E. Calyx. F and G. Bracteoles. H. Corolla split open. I. Anthers. J. Gynoecium. K. Stigma. L. Capsule with seeds. (A – *Reis 181*; B–K – *Marquete 1771*; L – *Bovini et al. 833*).

Herpetacanthus parvispica Indriunas & Kameyama, sp. nov. TYPE: BRAZIL. Rio de Janeiro, Volta Redonda, Floresta da Cicuta, 18 Apr 1990, *Carauta, Frigoletto, Pedrosa, Lima, Bosisio, Sodré, Côrtes 6009*. (holotype: GUA!).

Herpetacanthus parvispica H. pauciflоro Indriunas & Kameyama affinis sed petiolis (0.4–)1–1.5 cm longis, laminis 2.7–5.2×1.5–2 cm, bracteis large ellipticis ad ovatas, 0.8–1.7 × 0.6–1.3 cm, glabrescentibus, sparse ciliatis (v.s. petiolis 0.3–0.7cm longis, laminis 6–11.5 × 2.5–4.5 cm, bracteis ovatis 1.8–2.3 × 1.2–1.7 cm, glabris) differ.

Branched subshrub, stems terete, glabrescent, sparsely pubescent at the apex, anisophyllous. Leaves elliptic to ovate, apex mostly acute, obtuse or slightly acuminate, base acute, decurrent, the largest leaves of each node with petiole (0.4–)1–1.5 cm long, blade 4.6–5 × 1.5–2 cm, smallest leaves with petiole 0.2–0.5(–1.2) cm long, blade 2.7–5.2 × 1.5–2 cm, 3(–4) pairs of secondary veins, sparsely pilose and ciliate at the base. Inflorescence of one terminal and 2 axillary reduced spikes or tyrsus on the distal nodes and lower nodes, spikes or thyrsus with 1–3(–4) flowers, ca. 2 cm long, peduncle (3–)5–10(–17) mm long, bracts short petiolate, ca. 0.5 mm long, widely elliptic to ovate, apex acute or obtuse, sometimes slightly cuspidate, base obtuse to rounded, sometimes subcordate, often oblique, 0.8–1.7 × 0.6–1.3 cm, glabrate, sparsely ciliate. Bracteoles lanceolate, 1–1.5 × 0.25 mm, sparsely pilose, ciliate. Calyx segments lanceolate, 2–4 mm, glabrescent, ciliate. Corolla white, 15–25 mm, tube 8–10 mm, throat ca. 7 mm, long lower lip with lateral lobes ca. 5 × 2.5 mm, central lobe 5 × 4 mm, upper lip 7 × 5 mm, puberulous. anterior stamens ca. 5 mm long, thecae ca. 1.5 mm long; posterior stamens ca. 2.5 mm, thecae ca. 1 mm; filaments almost completely glabrous. Ovary ca. 1 mm long, glabrous. Style ca. 15 mm long, hirsute at the base. Capsule not seen. Figure 7

***Etymology*—**The specific epithet means short spike.

Distribution and ecology—*Herpetacanthus parvispica* is known only from the type material collected in a remnant of the Atlantic Forest in southwestern Rio de Janeiro State.

***Phenology*—**Flowering in April.

Herpetacanthus parvispica and *H. pauciflorus* are distinct from all other *Herpetacanthus* on the relatively long pedunculate and much reduced spikes or thyrsus with one to four flowers. *Herpetacanthus parvispica* differs from *H. pauciflorus* for the

leaves with petiole 1–1.5 cm long, blade 2.7–5.2 × 1.5–2 cm, bracts widely elliptic to ovate, 0.8–1.7 × 0.6–1.3 cm, glabrate, sparsely ciliate. *Herpetacanthus pauciflorus* has shorter petiole 0.3–0.7 cm, larger blade 6–11.5 × 2.5–4.5 cm, bracts ovate, 1.8–2.3 × 1.2–1.7 cm, glabrous.

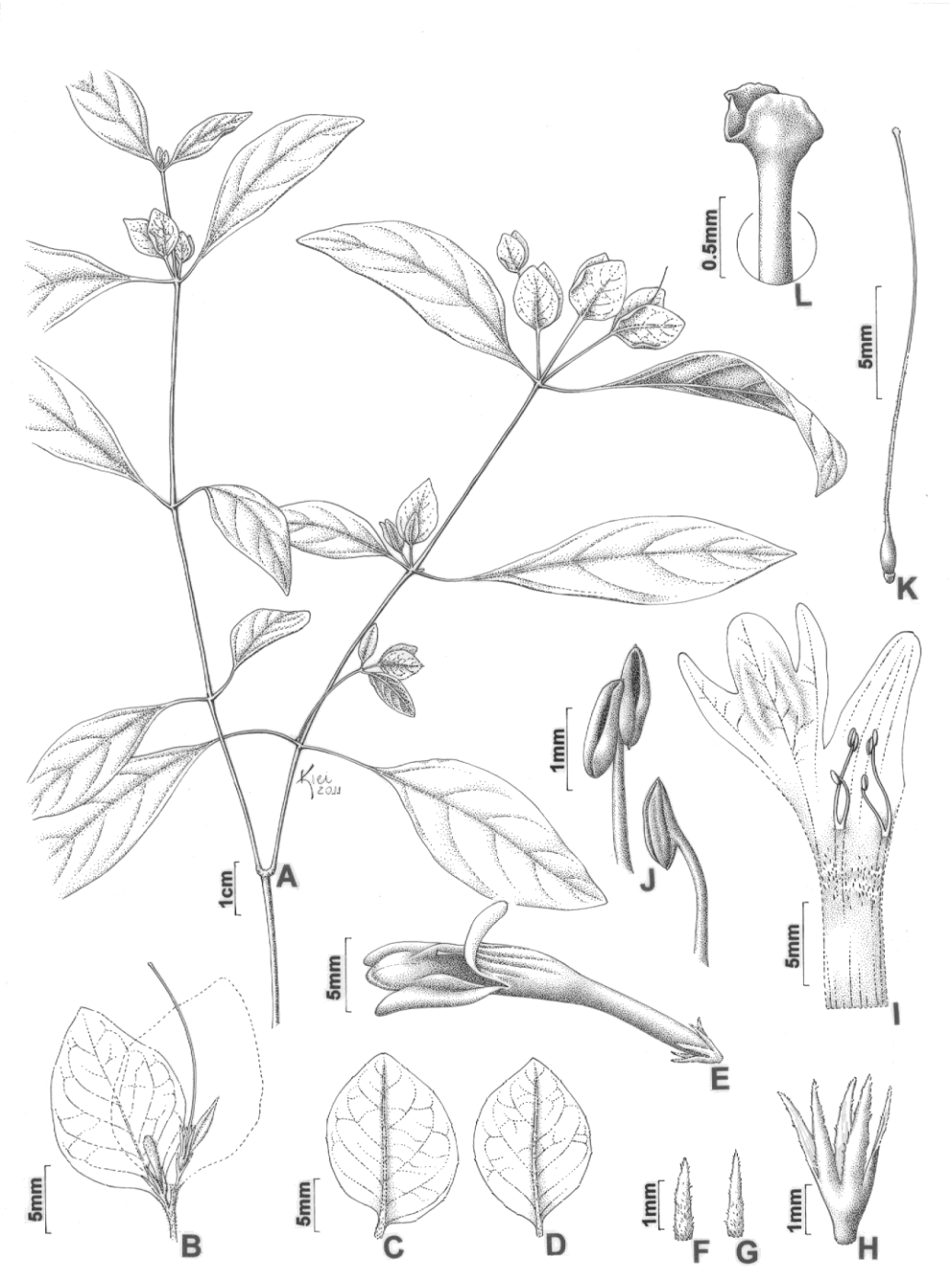

Fig. 7 – *Herpetacanthus parvispica* A. Flowering shoot. B. Spike. C. Fertile bract. D. Sterile bract. E. flower. F and G. Bracteoles. H. Calyx. I. Corolla split open. J. Anthers. K. Gynoecium. L. Stigma. (*Carauta et al.6009*).

Herpetacanthus pauciflorus Indriunas & Kameyama, sp. nov. – TYPE: BRAZIL. São Paulo, São Vicente, Parque Estadual Xixová-Japuí, 23º58'37" – 24º02'06" lat. S e 46º22'19" – 46º24'42" long. W, trilha da pedreira, segundo acesso sentido costeira, margem do caminho para o Morro do Japuí, 1 Feb 2002 *Pastore & Moura 1103* (holotype: SPSF!).

Herpetacanthus pauciflorus H. parvispicae Indriunas & Kameyama affinis, sed petiolis 0.3–0.7 cm longis, laminis 6–11.5 × 2.5–4.5 cm, bracteis ovatis, 1.8–2.3 × 1.2–1.7 cm, glabris (v.s. petiolis (0.4–)1–1.5cm longis, laminis 2.7–5.2 × 1.5–2 cm, bracteis large ellipticis ad ovatas 0.8–1.7 × 0.6–1.3 cm, glabrescentibus, sparse ciliatis) differ.

Erect to branched subshrub 25–50 cm, stems terete, glabrescent, sparsely pubescent at the apex, young stems with two lines of trichomes, slightly anisophyllous. Leaves elliptic, apex mostly acuminate, base acute, petiole 0.3–0.7 cm, blade 6–11.5 × 2.5–4.5 cm, 5(7–8) pairs of secondary veins, petiole sometimes puberulous, blade glabrous. Inflorescence of very reduced terminal and one axilary spikes or cymes on distal nodes spikes or cymes, 1–2 flowers, 2.5–4.5 cm long, peduncle 1–2.6 cm long, bracts short petiolate, ca. 1 mm long, ovate, apex acute or obtuse, sometimes acuminate, base rounded to subcordate, 1.8–2.3 × 1.2–1.7 cm, petiole inconspicuously ciliate, glabrous, margin slightly repand. Bracteoles lanceolate, 2–4 × 0.5 mm, sparsely ciliate. Calyx segments lanceolate, 2–3.5 × 0.5 mm, glabrescent, sparsely ciliate. Corolla white, inferior lobes yellowish, ca. 20 mm long, tube 6 mm long, throat ca. 6 mm long, lower lip with lateral lobes ca. 5× 3 mm, central lobe 5 × 5 mm, upper lip 6 × 3.5 mm, puberulous. Anterior stamens ca. 5 mm long, thecae ca. 1.5 mm long; posterior stamens ca. 2.5 mm, thecae ca. 1 mm long; filaments almost completely glabrous. Ovary ca. 1 mm long, glabrous. Style ca. 15 mm, glabrous. Capsule ca. 1.3 cm long, stipe ca. 0.6 long, head 0.7 cm long, glabrous. Seeds ca. 3 × 2 cm, papillate. Figure 8

***Etymology*—**The specific epithet means with few flowers.

Distribution and ecology—*Herpetacanthus pauciflorus* is known from two collections from two different areas about 80 km from each other, on the slopes of Serra do Mar, close to the sea on São Paulo coast. It grows in the understory at a rain forest.

***Phenology*—**Flowering in December and February, fruiting in December.

Herpetacanthus pauciflorus is similar to *H. parvispica* (see discussion on *H. parvispica).*

Additional Specimen Examined. **BRAZIL**. São Paulo: São Sebastião, Monte Forje, 23º45'16" S, 45º39'13" W, 18 Dec 1998, *Souza et al. 21671* (**ESA**).

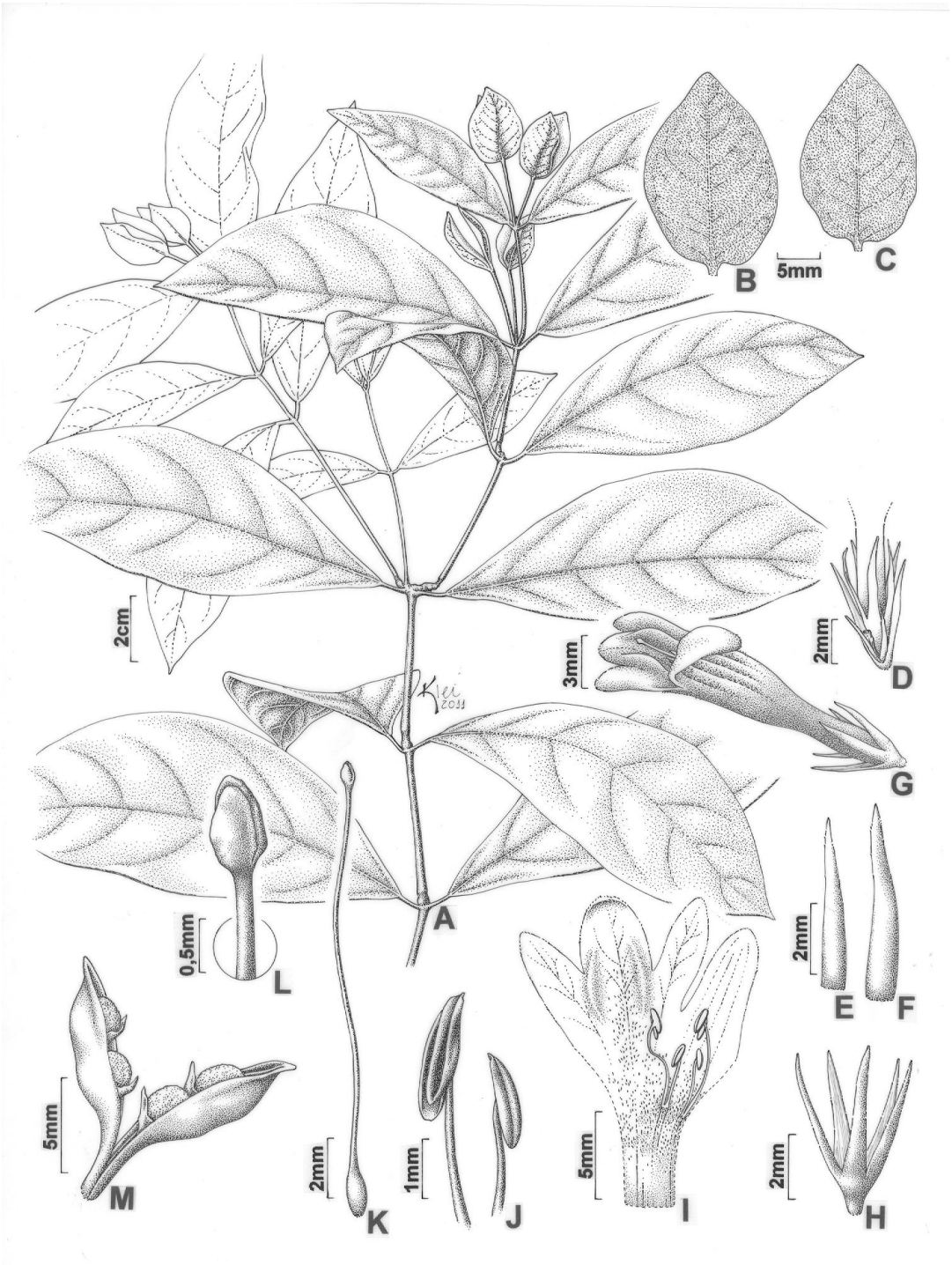

Fig. 8 – *Herpetacanthus pauciflorus* A. Flowering shoot. B. Fertile bract. C. Sterile bract. D. monochasium. E and F. Bracteoles. G. Flower. H. Calyx. I. Corolla split open. J. Anthers. K. Gynoecium. L. Stigma. M. Capsule with seeds. (*Pastore &Moura 1103*)

Herpetacanthus strongyloides Indriunas & Kameyama, sp. nov. – TYPE: BRAZIL**.** Cidade de Ilhéus, 3 km north of Rodoviária, Mata da Esperança, forest north of dam and reservoir, 14º46'55" S, 39º04'09" W, 50m, 16 Sep. 1994, *Thomas et al. 10503* (holotype: US!, isotype: MO!)

Affinis *Herpetacantho longifloro* Moric. habitu sed corollis minoribus, ca. 1.8 cm longis, bracteis rotundis et bracteolis minoribus, 4–6 mm longis (vs. corollis ca. 3 cm longis, bracteis ovatis ad ellipticas et bracteolis 12–15 mm longis) differt.

Branched subshrub, 0.5–1.5 m; stems terete, young stems with two inconspicuous longitudinal lines with inflexed eglandular trichomes ca. 0.5 mm long, older stems glabrescent, mostly anisophyllous. Leaves petiolate, elliptic to ovate, apex acute to acuminate, base acute to cuneate, long decurrent, often oblique, discolor, abaxial surface dark green, adaxial surface pale green, membranaceous, glabrescent, slightly ciliate, trichomes minute, (9)10–12 pairs of secundary veins, the largest leaves of each node with petiole (0.6–)1–2.5(–3) cm long, blade (11.3–)12.5–20(–24) × (3–)4–6.7(–8.2) cm, the smallest ones with petiole (0.2–)0.5–1.2(–2.7) cm long, blade (2.7–)4.8–22(–24) × (0.6–)2–6(–8.2) cm, leaves subtending the main inflorescence similar to the other leaves or similar to the bracts, but smaller. Inflorescence a terminal and two axillary spikes on the distal node, sometimes also on lower nodes, 1–5 flowers, 2.5–7.5 cm long, peduncle 0.3–0.6 cm long, glabrescent; rachis glabrescent; bracts imbricate, subsessile, rounded to widely elliptic, apex round, mostly briefly cuspidate, sometimes briefly retuse cuspidate, base obtuse, often slightly oblique, (7–)12–16 × (10–)14–18 mm, pale green, sometimes almost white basally, white or purplish, membranaceous, pubescent to sparsely hispid, with minute eglandular trichomes, often along veins, ciliate, with minute glandular and eglandular trichomes, often with two different sizes of eglandular trichomes. Bracteole linear-lanceolate, 4–6 × 0.5 mm, puberulent to puberulous, with glandular and eglandular trichomes, ciliate. Calyx segments lanceolate, ca. 5.5 × 0.5 mm, puberulent with glandular and eglandular trichomes, ciliate. Corolla white, sometimes with a purple macula on the throat, puberulous, ca. 18 mm long, tube 7 mm long, throat 4 mm long, lower lip with lateral lobes 3 × 2.2 mm, central lobe rounded, 2.4×3.8 mm, upper lip largely lanceolate, 6 × 4.8 mm. Anterior stamens 4.5 mm long, upper thecae ca. 1.5 mm long, lower ones, 1.2 mm long; posterior stamens 3.5 mm long, thecae 1.2 mm long; filaments sparsely glabrescent. Ovary ca. 2.5 × 1.2 mm, puberulent. Capsule not seen. Figure 9.

***Etymology*—**The specific epithet refers to the rounded bracts and corolla lower lip central lobe.

Distribution and ecology*—Herpetacanthus strongyloides* is known only from one locality in Ilhéus, in the state of Bahia, growing in the understory of a relatively well-preserved wet forest, nearby the urban area, close to a water reservoir.

***Phenology*—**Flowering in September and October

Herpetacanthus strongyloides resembles *H. longiflorus*, but is distinct by the larger membranaceous rounded bracts, 12-16 x 14-18 mm, shorter corolla, ca. 1,8 cm long, with a rounded central lobe. *Herpetacanthus longiflorus* has smaller bracts, chartaceous, ovate to elliptic, ca. 14 x 7 mm, and corolla ca. 3 cm long, with lanceolate central lobe.

***Additional Specimen Examined* —BRAZIL**. Bahia: Ilhéus, Mata da Esperança, Coletas efetuadas próximo à represa, 29 Oct 1994, *Amorim 1658* (**US**)

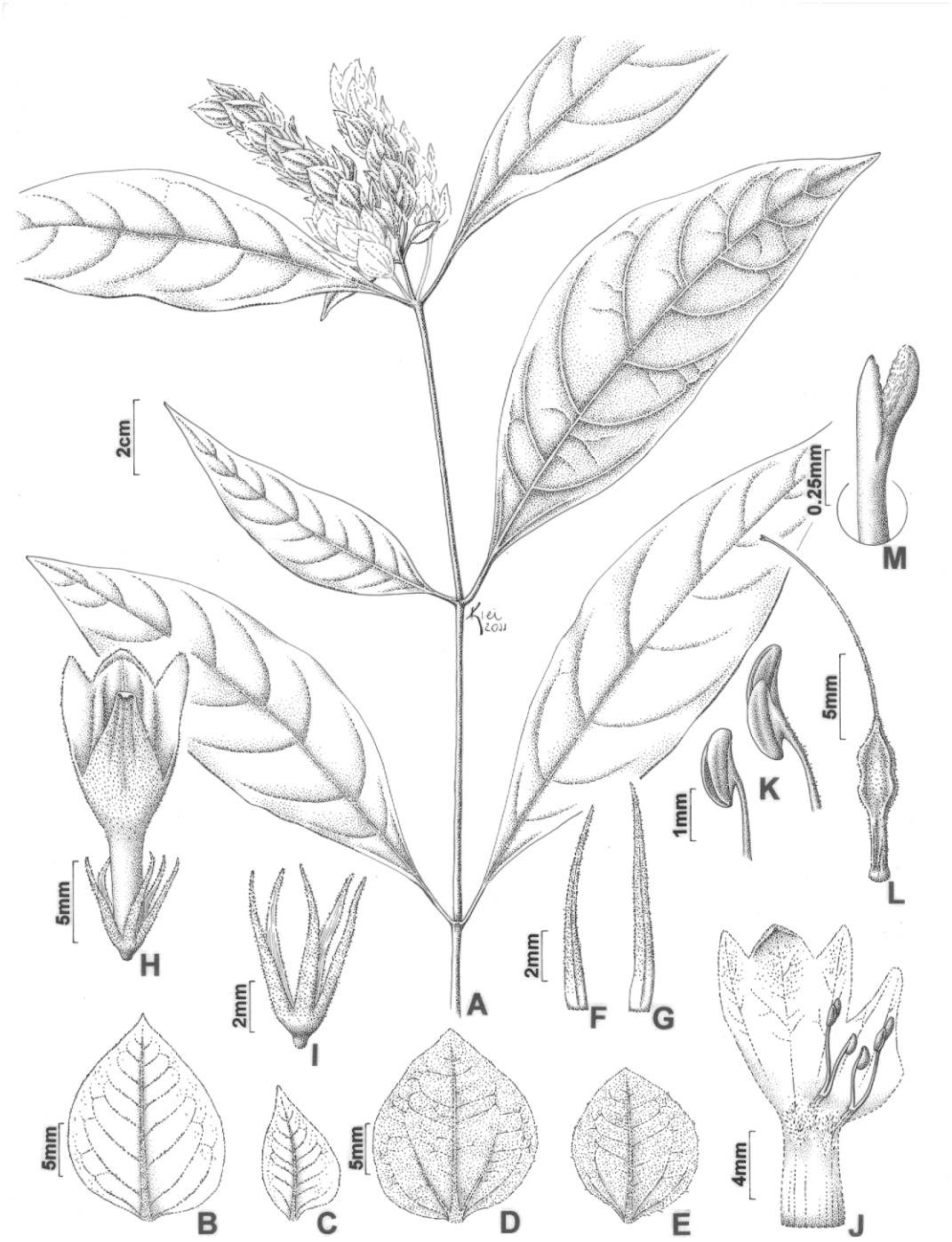

Fig. 9 – *Herpetacanthus stongyllioides* A. Flowering shoot. B and C. Leaves that subtend the inflorescence. D. Fertile bract. E. Sterile bract. F and G. Bracteoles. H. Flower. I. Calyx. J. Corolla split open. K. Anthers. L. Mature gynoecium. M. Stigma. (*Thomas et al. 10503*)

Key to *Herpetacanthus* to eastern Brazil

1 Leaves petiole almost the same length of the blade ..... *H. longipetiolatus*

1 Leaves petiole shorter than the blade length

2 Leaves blade base mostly cuneate-attenuate or cuneate-attenuate-truncate, often sessile to subsessile ..... *H. macrophyllus*

2 Leaves blade base acute, obtuse, rounded, never truncate, always petiolate

3 Bracteoles elliptic ½ to ¾ of bract width ..... *H. magnobracteolatus*

3 Bracteoles linear-lanceolate or lanceolate, sometimes obovate to oblanceolate, always narrow, less than ½ of bract width bract size

4 Spike or thyrsus not obviously secundiflorous; few flowered , usually one pair of bracts;

5 Leaves blade 2.7–5.2 × 1.5–2 cm, bracts 0.8–1.7 × 0.6–1.3 cm . *H. parvispicus*

5 Leaves blade 6–11.5 × 2.5–4.5 cm, bracts 1.8–2.3 × 1.2–1.7 cm *H. pauciflorus*

4 Spike or thyrsus often obviously secundiflorous; always with more than one pair of bracts

6 Corolla ca. 3 cm long

7 Bracteoles 1.2–1.5×0.25–0.8 cm; corolla with narrower and almost undistinguishable throat area, inflorescences 5–15 cm long; *H. longiflorus*

7 Bracteoles ca. 5–10×0.3– 0.5 mm; corolla with a well distinct and wider throat area, inflorescences 2 – 8 cm long;.....*H. neesianus*

6 Corolla less than 2.5 cm long

8 Bracts densely ciliate with conspicuous trichomes longer than 0.5 mm

9 Bracts rounded or oblong

10 Bracts mostly oblong, leaves blade 12–19.5 × 4.5–8 cm, abaxial surface generally strigose, adaxial usually pubescent; bracts ca. 25 × 20 mm ..... *H. tetrandrus*

10 Bracts mostly rounded, leaves blade (3.7–)5–10 × 1.2–3 cm, sparsely pilose to glabrescent on both surfaces; bracts ca. 10–15 × (7–)9.5–15 mm ..... *H. melancholicus*

9 Bracts elliptic, ovate or oblanceolate

11 Leaves narrow elliptic (l:w – 4:1 – 5:1), subshrubs erect or with sprawiling branches ..... *H. angustatus*

11 Leaves elliptic (l:w less than 4:1), ovate or oblong, subshrub that looks herbaceous ..... *H. rubiginosus*

8 Bracts not ciliate, very sparsely ciliate or ciliate with inconspicuous trichomes, less than 0.25 mm long

12 Bracts rounded

13 Largest leaves of each pair with petiole 1–1.6 cm, blade 11.3––24 × 3–8.2 cm; bracteole 4–6 × 0.5 mm, puberulent to puberulous ..... *H. strongyloides*

13 Largest leaves of each pair with petiole 0.5–0.6(–1.2) cm long, blade , blade 4–13 × 2.9–6.5 cm; bracteoles ca. 3.0 × 0.5 mm, hirsute ..... *H. chalarostachyus*

12 Bracts elliptic, ovate or oblanceolate ..... *H. delicatus*

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CAPÍTULO 2 – SYNOPSIS OF *HERPETACANTHUS* (ACANTHACEAE)

Abstract
Herpetacanthus as here recognized contains 18 neotropical species, 13 from the Atlantic Forest in Brazil, from southern São Paulo State to southern Bahia State; one from a deciduous forest (Mata de Cipó) in Bahia; two from Amazon (Brazil, Bolivia, Colombia, Ecuador and Peru); and two in Central America (Costa Rica, Honduras, Nicaragua e Panama). The species are subshrubs to shrubs, usually anisophylous, distinct from other Acanthaceae by the calyx with five subequal segments, bilabiate corolla, usually the upper lip bidentate and lower lip trilobate; four didynamous stamens, the anterior with bithecous anthers, thecae inserted at different levels on the connective, and the posterior monothecous; inflorescences of secundiflorous spikes or thyrsus with two adjacent rows of sterile bracts and two adjacent rows of fertile bracts, where the sterile bracts seems to be upward displaced from their pairs and laterally displaced toward to the subsequent fertile bracts, resulting in a peculiar arrangement; cleistogamy is relativaly common. This synopsis was based on the analysis of herborized material from 27 herbaria, including nomenclatural types or digitalized images, field work and observation of cultivated plants. Six lectotypifications and one neotypification are proposed. Species descriptions, botanical illustrations, and a dichotomous key to distinguish the species of Herpetacanthus are provided.
Keywords: Justiciae, lectotypification, neotypification, neotropics

Herpetacanthus Nees is a neotropical genus that comprises 18 species, distributed along three areas: Eastern Brazil, from southern state of São Paulo to southeastern state of Bahia; Amazon in Brazil, Bolivia, Colombia, Ecuador, and Peru; and Central America in Costa Rica, Honduras, Nicaragua e Panama. Because this small genus has received little attention, even in floras studies, half of the species was described recently (Indriunas & Kameyama 20XX) and many herbaria specimens were undetermined and filed within other genera.

Herpetacanthus longiflorus Moric. from southern Bahia state, in Brazil, was the first species described (Moricand 1847) and Nees (1847a) presented the first genus description with five new species from the Atlantic Forest, Brazil, placing it in Tribe Gendarusseae. In Lindau (1894, 1895) classification system *Herpetacanthus* was in subfamily Isoglosseae, subtribe Isoglossinae. Bremekamp (1965) placed it in subfamily Odontonemeae, tribe Asystasiinae, and consider *Juruasia* Lindau as a synonym of *Herpetacanthus* tranfering its two species described for Brazilian western Amazon. Leonard (1942) described the first species of *Herpetacanthus*, *H. panamensis* Leonard, to Central America, ten years later he described a new monotypic genus (Leonard 1952), *Standleyacanthus*, with *S. costaricanus* Leonard, that was later considered a synonym of *H. panamensis* (Durke 1978), at the end of last century another species from Central America was described (Gomes & Laurito 1991), *H. stenophyllus* Gomes-L & Laurito for Costa Rica. Recently, during the preparation of this revision, nine species were described (Indriunas & Kameyama 20XX). In phylogenetic analysis (McDade et al. 2008) *Herpetacanthus* is in a basal clade in Tribe Justiciae (*Pseuderanthemum* lineage), but the relative position inside this lineage is still to be clarified. Although it shares many plesiomorfic characters with genera of *Pseuderanthemum* lineage, it has some unique morphological features distinguishing from the closest analyzed genera from the same clade (Indriunas & Kameyama 20XX).

Material and Methods

Morphological studies were based on the examination of about 450 herbarium specimens from the following herbaria (those marked with an asterisk were visited by at least one of the authors specifically for this work): ESA*, FUEL*, GUA*, HBR*, HLP*, HRBC*, HUEFS*, IAC*, IAN*, INPA*, MBM*, MBML*, MG*, MO, NY, PMA, PMSP*, R*, RB*, SP*, SPF*, SPSF*, UEC*, UESC*, UNIP*, UPCB*, VIES*,

from images of types of the follow herbaria: BR, F, G, GZU, K, W, and on field studies. Due to the lack of enough material for other analysis, pollen were observed only under scanning electron microscopy (SEM), mainly to observe aperture and surface, so we were not able to take measures to precisely determine shape and ornamentation. Pollen grains were removed individually from anthers on herbarium specimens with pins and mounted directly on SEM stubs, without any prior treatment, coated with gold and analyzed under Phillips XL20.

Results and discussion

Morphology

Habitat and Habit – Herpetacanthus species occur in forest, mostly in the understory of wet forest from sea level to 1300 m, but some species can also occurs at partial shade on borders or disturbed forest as *H. panamensis* and *H. rotundatus* (Lindau) Bremek. or in moist deciduous forest as *H. magnobracteolatus* Indriunas & Kameyama, on different soils, including sandy soils close to the sea and inundated areas. Species of *Herpetacanthus* are small decumbent or erect subshrubs, or not so small erect to sprawling shrubs. Decumbent subshrubs and species with sprawling branches usually have adventitious roots at the nodes that touch the substrate, spreading vegetatively and forming relatively large populations, as *H. rubiginosus* Nees and *H. chalarostachyus* Indriunas & Kameyama. A very common feature in *Herpetacanthus* are two or four lines of erect or reflexed trichomes along the young stems, they can be very long and evident, as in *H. rubiginosus*, or not as in *H. macrophyllus* Nees. The leaves, as in many Acanthaceae, are decussate and in most of the species evidently anisophyllous (leaves born at the same node having different sizes), this is also present in many unrelated species of Acanthaceae (Sell 1968, Brummit 1989; Manktelow 1996; Kameyama 2008). In some species differentiated leaves also occur close to the inflorescences, the leaves near the main florescence can be different from the others in shape, color and venation pattern and usually are intermediate between normal leaves and bracts.

Inflorescence and cleistogamy – Inflorescence basic unit is a spike or thyrsus with few flowered monochasium (Fig 1A), there is always a terminal unit and frequently one or two axillary units on the most distal node, as in *H. rubiginosus*, *H. tetrandrus* (Nees & Mart.) Herter and *H. stenophyllus*, sometimes also on lower nodes, in few species there

are 2nd or, rarely, 3rd order branches, as in *H. longiflorus* Moric. and *H. neesianus* Indriunas & Kameyama. Spikes or thyrsus can be subsessile or pedunculate and are always secundiflorous, although, on some much reduced spikes and thyrsus, as in *H. pauciflorus* Indriunas & Kameyama and *H. parvispicus* Indriunas & Kameyama this is not evident because the spike or thyrsus develops only one to two nodes, usually there are four to six flowers and the longer units can bear up to 10 flowers as in *H. longiflorus* and *H. neesianus*. The spikes or thyrsus, that probably are derived from a decussate thyrsus, have two adjacent rows of sterile bracts and two adjacent rows of fertile bracts, where the sterile bracts seems to be displaced upwards from their pairs and laterally toward the subsequent fertile bracts; the first bract in a spike is fertile and has no adjacent sterile bract, its sterile pair, because of the displacement is adjacent, but inserted slightly below the second fertile bract and so on in such way that each flower is subtended by one fertile bract and two bracteoles and adjacent to a sterile bract, resulting in peculiar arrangement (Fig. 1B), that, according to Bremekamp (1968) is unique in all Acanthaceae. It is very similar to secundiflorous inflorescence of *Lepidagathis* (tribe Barleriae) (Kameyama 2008) differing only in the absence of lateraly displacement of sterile bracts in *Lepidagathis*. We believe that this unusual inflorescence structure could be a sinapomorphy to *Herpetacanthus*. On thyrsus, fertile bracts subtend a monochasium with two to rarely three flowers. Commonly we observe a transition between spike and thyrsus, with dichasium developing only at some nodes. We observed in some plants of *H. chalorastachyus*, under cultivation, a spike with chasmogamous flower developing into a thyrsus when cleistogamous flowers grew at the axil of the bracteoles of chasmogous flowers whose corollas had already fallen. All cleistogamous flowers developed fruits, whether it happens because the chasmogamous flowers were not fertilized is a matter to be investigated. Based on the examination of herbarium material, it is possible that the same process occurs in *H. rubiginosus, H. longiflorus, H.macrophyllus and H. neesianus*. Some spikes can bear only cleistogamous flower, as we observed in one individual of a cultivated *H. chalarostachyus,* whose bracts were smaller and green. Cleistogamy is known among many species of Acanthaceae, specially *Ruellia* (Vollensen & Brummit 1981; Lima et al 2005, Long 1971, 1974; Tripp 2007; Culley & Klooster 2007 and references therein). Bracts are usually green commonly vinaceous, they can also be more conspicuous being white to purple, mostly are basal actinodromous reticulate, 3(5)-nerved, some lateral veins can be inconspicuous giving a uninerve aspect. Sometimes the basal pair, usually

the first fertile bract, is camptodromous as leaves. Fertile and sterile bracts can be slightly differentiated, usually fertile bract smaller than the sterile, or they can be differentiated being different in size and shape. Generally spikes, or thyrsus, start to flower before the complete development of the axis, sometime when it is very short and the internode axis continuous to grow after fruiting, so older inflorescences are looser than young ones and distal bracts are smaller than proximal bracts.

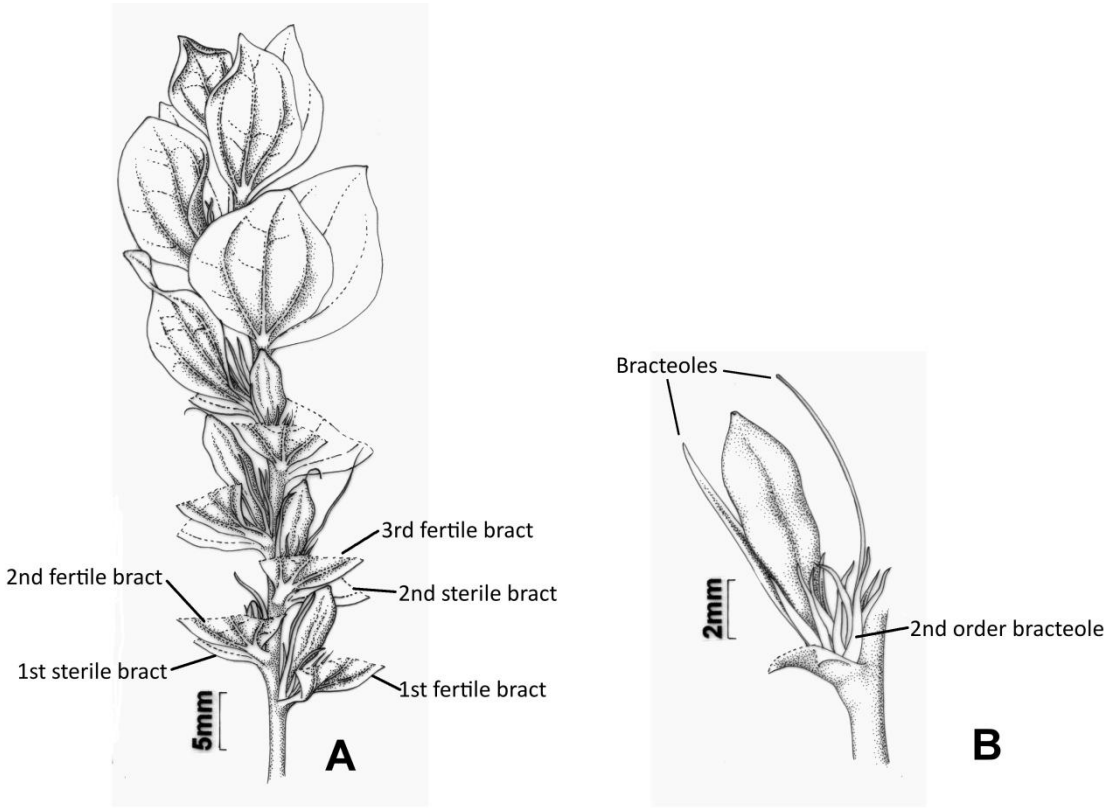

Fig. 1 Inflorescence of *Herpetacanthus charalostachyus*. A. Thyrsus. B. Monochasium. Draw by Klei Sousa.

Flower – *Herpetacanthus* flowers have a calyx with five almost equal segments, the anterior segment is slightly longer than the others. Corolla is bilabiate, commonly personate, the upper lip is slightly bidentate and lower lip is trilobed with a more or less developed palate, that usually has a different color or markings; the tube can be divide into two different portions, a narrow tubular base portion and a funnelform, often depressed, throat, in *H. longiflorous* the width difference between the two portions is small, so they are not very well diferentiated. Personate corolla is common among Justiciae and also occurs in other Acanthaceae, but this is unique among the most basal Justiciae (*Pseuderanthemum* clade, see McDade 2008). Androecium has four stamens didynamous, the anterior are longer and bithecous, thecae inserted at different levels at the connective, the posterior are shorter and monotecous, this condition is also found in Justiciae genera *Pranceacanthus* and *Isotheca*. Four elements in the adroecium is plesiomorphic in Lamiales (McDade 2008) and the reduction of one or both thecae of a pair is rather common in related and unrelated groups of Acanthaceae (McDade 2008, Kameyama 2008). Pollen grains are mostly tricolporates hexapseudocolpates, but there are some tetracolporates, because we were not able to measure the grains, due to the lack of material, we could not classify precisely shapes and surface types, but they seems to vary between perforate, fossulate, verrucate, microechinate. This pollen type seems to be synapomophic to Justicieae and is presented in genera of many different lineages of this tribe (McDade et al. 2000) (Fig. 2). Ovary is glabrous to pilose, usually ca. 1 mm long, style long, flattened, glabrous to pilose and the stigma usually minute bilobed.

Fruit – Capsule has a sterile basal portion (stipe) and an elliptic fertile portion (head) with acuminate apex. Four seeds, sometimes 2 for abortion. Nees (1847a) cited eight seeds for *Herpetacanthus*, but we do not observed it. Seeds are flattened, rounded, usually papilate.

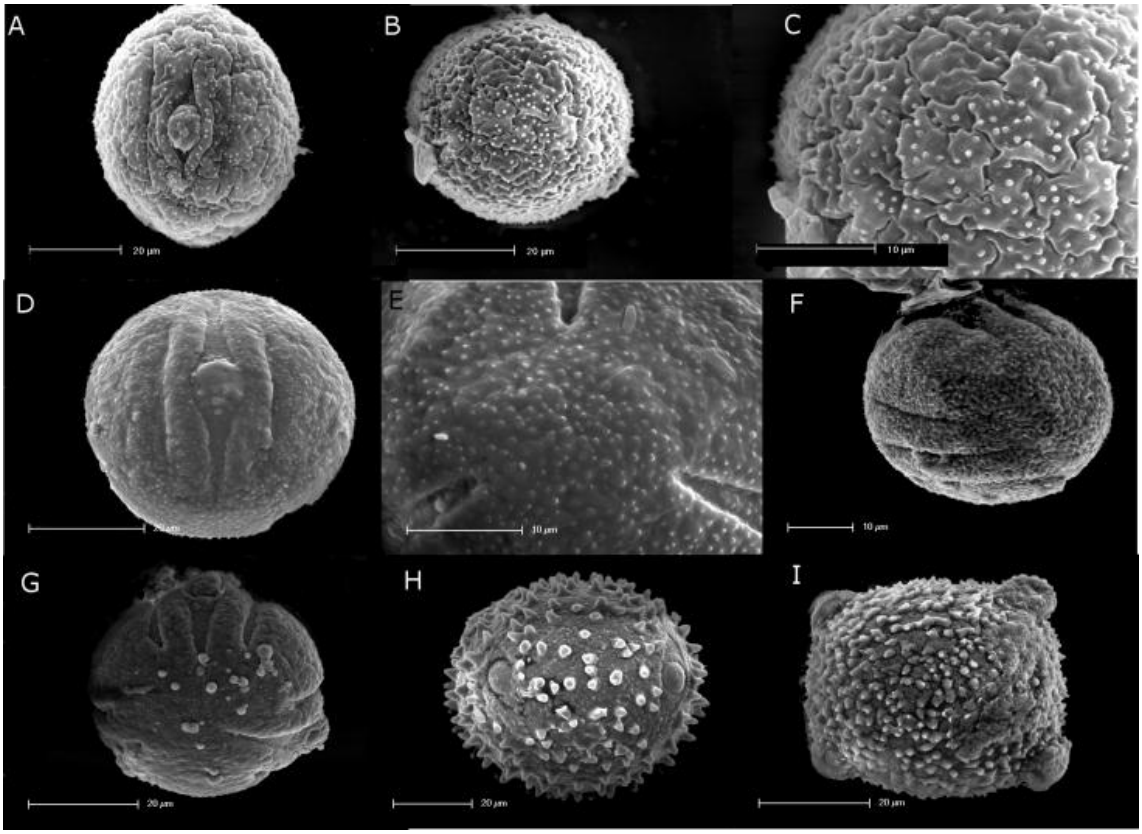

Fig. 2 Polens of *Herpetacanthus*. A – B. *H. chalarostachyus.* A. colpal view B. polar view C. exine surface.D – E. *H. neesianus*. D. colpal view E. exine surface on polar view. F. *H. longipetiolatus*. G. *H. angustus* polar view. H. *H. longiflorus* intercolpal view. I. *H. melancholicus* var *melancholicus* polar view. (A-C. *Melo 1014*; D-E. *Marquete 1771*; F. *Vervloet 3174*; G. *Kollman et al. 8759*; H. *Santana et al. 606*; I. *Thomas et al. 11940*).

Taxonomic Treatment

Herpetacanthus Nees in Moricand, Pl. Nouv. Amér. 159. Mar 1847. Type: *Herpetacanthus longiflorus* Moric.

Schultzia Nees & Mart., Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 11(1): 63. 1823, nom. illeg. (non *Schultzia* Rafinesque 1808 (*non. rej*.), nec *Schultzia* K. P. J. Sprengel 1813 (*nom. cons*.)) Type: *Dicliptera tetrandra* Nees & Mart. Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 11(1): 61. 1823.

Juruasia Lindau, Bull. Herb. Boissier sér. 2. 4: 402. 1904. Type: *Juruasia acuminata* Lindau.

Standleyacanthus Leonard, Ceiba 3: 142. 1952. Type: *Standleyacanthus costaricanus* Leonard.

Subshrubs or shrubs with cystoliths, young stems with two or four lines of erect or reflexed trichomes. Leaves opposite, usually anisophyllous, subsessile to petiolate, entire, rarely slightly repand. Inflorescence of subsessile or pedunculate terminal spikes or thyrsus with few flowered monochasium and frequently compound with terminal or 2 axillary on distal node, sometimes also on lower nodes, sometimes 2nd or, rarely, 3rd branches; always secundiflorous; spikes or thyrsus one up to ten flowers. Bracts conspicuous, green, white, vinaceous or purple, displace in 2 adjacent rows of sterile bracts and two adjacent rows of fertile ones, the sterile bracts displaced upwards from their pairs and laterally toward the subsequent fertile bracts; the first bract fertile. Flowers subtended by 2 bracteoles, often acrescent. Calyx 5-segmented, slightly unequal with anterior segment slightly longer. Corolla white, light purple to purple, generally with purple, lilac or vinaceous markings or lines at palate, bilabiate, commonly personate, the upper lip slightly bidentate, lower lip trilobed, with a more or less developed palate, tube divided in a narrow tubular base portion (tube) and a funnelform, often depressed (throat), pilose at distal portion of the tube. Stamens 4, didynamous, inserted at base of corolla throat, anterior one longer, bithecous, thecae inserted at different levels at the connective, posterior shorter, monotecous; thecae subequal, muticous. Ovary usually ca. 1 mm long, glabrous to pilose, style long, flattened, glabrous to pilose, stigma usually minute bilobed. Capsule with a sterile basal

portion (stipe) and an elliptic fertile portion (head), apex acuminate. Seeds 4, sometimes 2 for abortion, flattened, rounded, usually papilate.

Key of *Herpetacanthus* species

1 Leaves petiole almost the same length of the blade ..... *H. longipetiolatus*

1 Leaves petiole shorter than the blade length

2 Leaves linear-lanceolate (l:w – ca. 10:1) ..... *H. stenophyllus*

2 Leaves elliptic, oblong, ovate, never linear lanceolate (l:w always less than 10:1)

3 Leaves blade base mostly cuneate-attenuate or cuneate-attenuate-truncate, often sessile to subsessile ..... *H. macrophyllus*

3 Leaves blade base acute, obtuse, rounded, never truncate, always petiolate

4 Bracteoles elliptic ½ to ¾ of bract width ..... *H. magnobracteolatus*

4 Bracteoles linear-lanceolate or lanceolate, sometimes obovate to oblanceolate, always narrow, less than ½ of bract width bract size

5 Spike or thyrsus not obviously secundiflorous; few flowered , usually one pair of bracts;

6 Leaves blade 2.7–5.2 × 1.5–2 cm, bracts 0.8–1.7 × 0.6–1.3 cm ..... *H. parvispicus*

6 Leaves blade 6–11.5 × 2.5–4.5 cm, bracts 1.8–2.3 × 1.2–1.7 cm .....*H. pauciflorus*

5 Spike or thyrsus often obviously secundiflorous; always with more than one pair of bracts

7 Corolla ca. 3 cm long

8 Bracteoles 1.2–1.5×0.25–0.8 cm; corolla with narrower and almost undistinguishable throat area, inflorescences 5–15 cm long .....*H. longiflorus*

8 Bracteoles ca. 5–10×0.3– 0.5 mm; corolla with a well distinct and wider throat area, inflorescences 2 – 8 cm long; .....*H. neesianus*

7 Corolla less than 2.5 cm long

9 Bracts densely ciliate with conspicuous trichomes longer than 0.5 mm

10 Bracts rounded or oblong

11 Bracts mostly oblong, leaves blade 12–19.5 × 4.5–8 cm, abaxial surface generally strigose, adaxial usually pubescent; bracts ca. 25 × 20 mm ..... *H. tetrandrus*

11 Bracts mostly rounded, leaves blade (3.7–)5–10 × 1.2–3 cm, sparsely pilose to glabrescent on both surfaces; bracts ca. 10–15 × (7–)9.5–15 mm ..... *H. melancholicus*

10 Bracts elliptic, ovate or oblanceolate

12 Leaves narrow elliptic (l:w – 4:1 – 5:1), subshrubs erect or with sprawiling branches..... *H. angustatus*

12 Leaves elliptic (l:w less than 4:1), ovate or oblong, subshrub that looks herbaceous

13 Small subshrub that seems herbaceous, creping or decumbent, younger stems often with two longitudinal lines with conspicuous reflexed eglandular trichomes, up to 1 mm long , bracts apex mostly obtuse, sometimes abruptly cuspidate..... *H. rubiginosus*

13 Subshrubs erect or with sprawiling branches, younger stems with two longitudinal lines with trichomes, but not often conspicuous, bracts apex mostly acute acuminate to abruptly acuminate ..... *H. acuminatus*

9 Bracts not ciliate, very sparsely ciliate or ciliate with inconspicuous trichomes, less than 0.25 mm long

14 Bracts rounded

15 Calyx glabrate, sparsely ciliate only in the apex ..... *H. rotundatus*

15 Calyx pilose, ciliate

16 Largest leaves of each pair with petiole 1–1.6 cm, blade 11.3–24 × 3–8.2 cm; bracteole 4–6 × 0.5 mm, puberulent to puberulous ..... *H. strongyloides*

16 Largest leaves of each pair with petiole 0.5–0.6(–1.2) cm long, blade , blade 4–13 × 2.9–6.5 cm; bracteoles ca. 3.0 × 0.5 mm, hirsute ..... *H. chalarostachyus*

14 Bracts elliptic, ovate or oblanceolate

17 Bracts unequal shape, fertile mostly oblanceolate, sometimes elliptic, 7–10 × 2–4 mm, bracts sterile elliptic, 8–12 × 3.5–5.5 mm, leaves narrowly elliptic, 3.5–6.2 × 0.9–1.2 cm ..... *H. delicatus*

17 Bracts equal shape, ovate to elliptic, ca. 12×6 mm, leaves elliptic to ovate, 4–15.5×2.2–6.2 cm ..... *H. panamensis*

Herpetacanthus acuminatus (Lindau) Bremek. Rec. Trav. Bot. Neerl. 35: 164. 1938. *Juruasia acuminata* Lindau Bull. Herb. Boissier ser. 2, 4: 403. 1904. Type: Brazil. Amazonas: Rio Juruá, Juruá Miry, Oct 1901, *E. H. G. Ule 5848* (lectotype, here designated: MG; isolectotype: K [photo], F [photo]).

Subshrub 0.30–0.75 m; stem terete to subquadrate, glabrescent, slightly anisophyllous. Leaves elliptic to ovate, apex obtuse to acute, base mostly obtuse, petiole 0.3–0.7(–1) cm long, blade 3.5–9 × 2–3.7 cm, petiole and blade base often pubescent, minutely ciliate. Inflorescence a terminal and one or two axilary spikes on the distal node, sometimes also on lower nodes, 1–4.5 cm long long, peduncle ca. 0.4 cm long, mostly pubescent. Bracts green to vinaceous, elliptic to ovate, apex mostly acute acuminate to abruptly acuminate, base mostly acute, ca. 12 × 6 mm, glabrescent, long ciliate. Bracteoles linear-lanceolate to lanceolate, 5.5–7.5 × 0.5 mm, ciliate. Calyx segments lanceolate, 2.5 × 0.3 mm, glabrate, ciliate. Mature corolla not seen. Ovary glabrous, except for the apex. Style ca. 8 mm, hispid at the base. Capsule ca. 1 cm, glabrous, except for minute trichomes at the apex. Seeds ca. 2.5 × 2 mm. (Fig. 3B and 4A-B)

Distribution and Ecology – Brazil (Acre, Pará, Rondônia), Peru. In the understory of primary in inundate (igarapé) or noninundate (terra firme) forests. (Fig. 5)
Phenology – Flowering and fruiting from May to September.

Selected specimens examined. PERU. **CUZCO:** Camisea, Campamento Malvinas, 11º52'12" S, 72º56'28" W, 450-23 September 1997, *Acevedo-Rdgz. et al. 9891* (NY); **MADRE DE DIOS:** Parque Nacional de Manu, Trail from Cocha Cashu camp to non-alluvial area behind camp, 380-21 October 1979, *Gentry et al. 27124* (US).

BRAZIL. **ACRE:** Cruzeiro do Sul, Serra da Moa, near school, 1 May 1971 *Maas et al P12701*; (INPA); Mâncio Lima, Upper Rio Moa, base of Serra Azul, 7º29' S, 73º39' W, 12 October 1986, *Campbel et al. l8920* (NY); **RONDÔNIA:** Ca. 1.5 km from the intersection of highway BR-421 and TB-40-LC80, SSE of Ariquemes, 26 May 1984, *Frame et al.205A* (INPA); **PARÁ:** Tucuri, Fazenda Guaripé Alfa Pastoril, Catanhal Maria Bezerra, margem esquerda do Rio Caripé. Amostra nº 1. Várzea, onde vai ser inundada pela represa de Tucurui, 11 May 1980 *Rosa 3652* (MG).

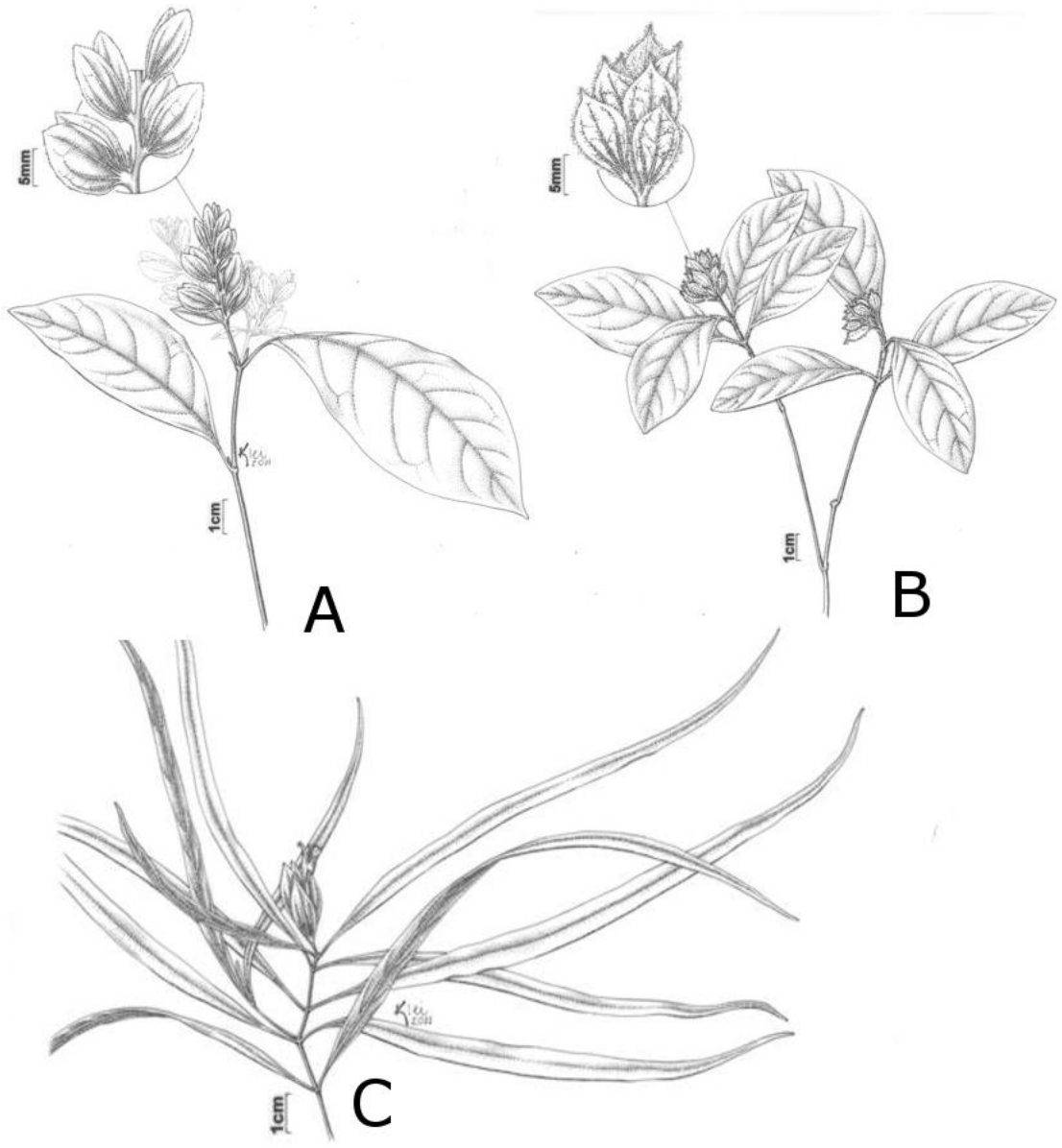

Fig. 3 A. *Herpetacanthus panamensis*. B. *H. acuminatus*. C. *H. stenophyllus*. (A – *Stevens 23735*; B – *Campbell et al.8920*; C – *Daniel et al.6227*).

Fig. 4 – Species of *Herpetacanthus*. A and B. *H. acuminatus*. A. Habit. B. Mature inflorescence. C. *H. angustatus*, habit. D – F. *H. chalarostachyus*. D. Habit. E – F. Inflorescence. G. *H. macrophyllus*, habit. H and I. *H. magnobracteolatus*. I. Habit. H. Inflorescence. (Photos by: A and B – *C. Pessoa*. C – *H. Lorenzi*. D.and G – *A. Indriunas*. E and F – *C. Kameyama*. H and I – *A. L. A Côrtes*.

Herpetacanthus acuminatus is similar to *H. rotundatus* but differs in the denser indument and long ciliate bract, *H. rotundatus* is sparsely short ciliate. Lindau (1904) differentiated these species by the bract apex, acuminate in *H. acuminatus* and rounded in *H. rotundatus*, but a unique individual of *H. rotundatus* can present bracts with rounded and shortly acuminate apex. In describing *Juruasia acuminata*, Lindau (1904) cited two sintypes (Ule's collection 5701 and 5848) and pointed out that the type was at Herbarium B, but both materials were destroyed, therefore we select Ule's collection 5848 from Herbarium MG as lectotype.

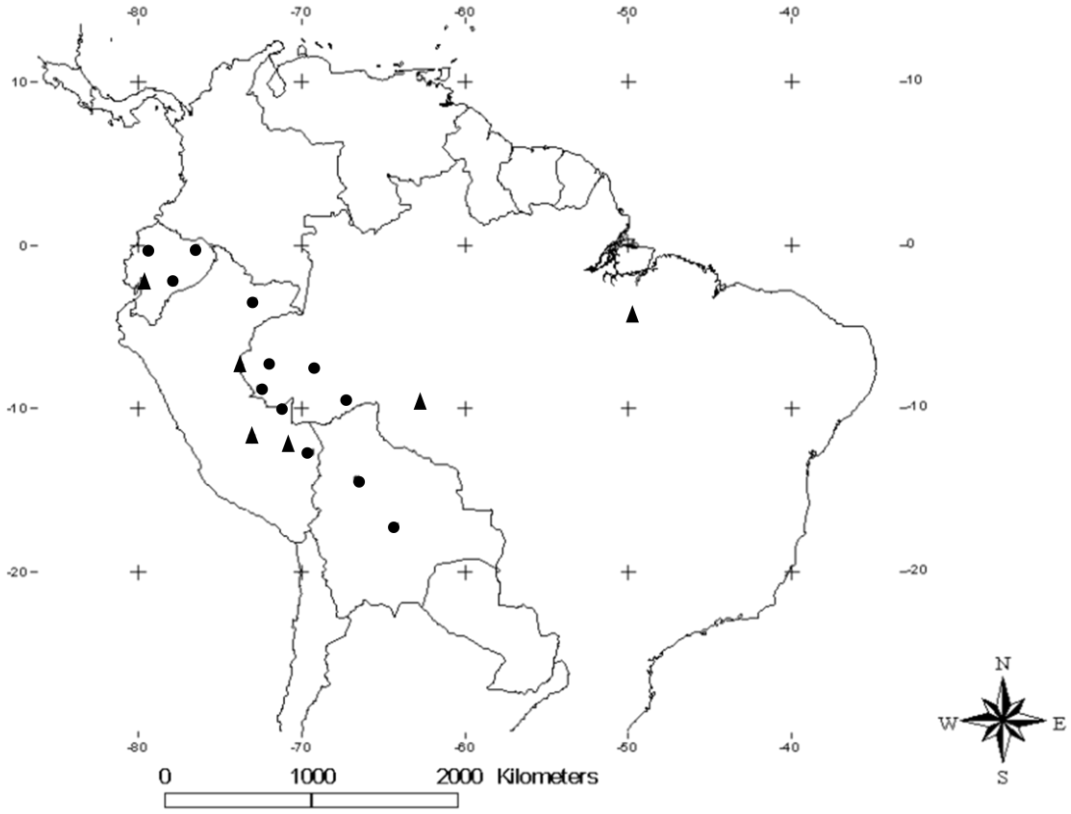

Fig. 5 – Distribution of *Herpetacanthus acuminatus* (▲) and *H. rotundatus* (●) in South America.

Herpetacanthus angustatus Indriunas & Kameyama, Syst. Bot. 20XX. Type: Brazil. Espírito Santo: Santa Tereza, Valsugana Velha, 7 Mar 1986, H. Q. B. *Fernandes 1885* (holotype: MBML; isotype: SP, US).

Branched subshrub, (0.3–)0.5–1 m tall; stems terete to subquadrate, glabrescent, slightly anisophyllous. Leaves blade narrowly elliptic, apex acute, base acute long decurrent, discolor, abaxial side sometimes silvery, largest leaves of each node, petiole 0.3–0.5(–1) cm, blade (6–)8–11.5(–14.5) × (1.3–)1.7–2.7(–3) cm, the smallest ones, petiole 0.4–0.6(–1) cm, blade (3.3–)4–10.5(–13) × 1–2(–2.5) cm, glabrescent, sparsely pubescent on the midrib, sparsely ciliate. Inflorescence of one terminal and two axilary spikes on the distal node, sometimes also on lower nodes, spikes 1–6 flowers, 2.5–4 cm long, peduncle 2.5–5 mm long, tomentose to pilose. Bracts elliptic rarely ovate, apex acute to acuminate, base acute, pale green, white or white with purple apex, or purple, 13.0–17.0 × 8–10 mm, fertile bracts slightly smaller, pubescent, ciliate. Bracteoles lanceolate, ca. 5 × 0.5 mm, pubescent, trichomes minute, ciliate. Calyx segments lanceolate, ca. 4 × 0.5 mm, pubescente, ciliate. Corolla lilac or white pink-lined, ca. 22 mm, tube ca. 12 mm, throat 8 mm, lateral lobes 2 × 1 mm, central lobe 2 × 2 mm, upper lip 6 × 4 mm, externally puberulous, lobes ciliate. Anterior stamens ca. 5 mm long; posterior stamens ca. 4 mm; filaments sparsely glandular-pilose; Ovary glabrous. Style 20 mm long, glabrescent. Capsule ca.1 × 0.2 cm, glabrous. Seeds ca. 2 × 1.5 mm. (Fig. 4C)

Distribution and Ecology —In the municipalities of Santa Tereza, Santo Antônio do Alto and Santa Leopoldina, in the state of Espírito Santo. It grows on shade and wet places in understory of the rain forest about 700 m. (Fig 6).
Phenology — Mostly flowering from January to April, sometimes in September; fruiting in April.

Selected specimens examined. BRAZIL. **ESPÍRITO SANTO:** Santo Antônio, Terreno do Boza, 750-9 Mar. 1999, *Kollmann et al. 2050* (SP); Santa Tereza, Estação Biológica de São Lourenço, Caixa d'água, 6 Mar. 2002, *Lorenzi 3210* (HPL); Estação Biológica de São Lourenço, divisa com João Romagna, trilha de mata primária, 20 Apr. 2002, *Fontana 343 et al* (SP); Bairro Centenário, Mata do Gilmar, 19º56'09" S, 40º36' W, 17 Mar. 2006, *Kollmann et al. 8759* (MBML, RB); Mata do Tabajara, na trilha que acompanha o cano d'água, ao lado da cachoeira do Tabajara, 29 Jan. 1997, *Hupp 69 et*

al. (MBML**,** SP), Mata do Bonfim., mata sobre o morro ao lado da BANESTES, 19º56'02" S, 40º35'22" W, 767 m, 3 Apr. 2009, *Cardoso 2466 et al.* (HUEFS); Santa Leopoldina, Rio Bonito, propriedade do Sr. Valdomiro Plaster, 20º03'81" S, 40º36'44" W, 615m, 27 Jan. 2007, *Fontana et al. 2738* (MBML, RB).

Herpetacanthus angustatus resembles *H. neesianus* Indriunas & Kameyama from which it is distinct by the leaves with narrowly elliptic blade, acute decurrent base and acute apex, and inflorescences with short peduncle up to 5 mm long, *H. neesianus* has ovate to ellipitic blades, acute base often narrowly decurrent and acute to acuminate apex, and inflorescence peduncle 2-6 cm long.

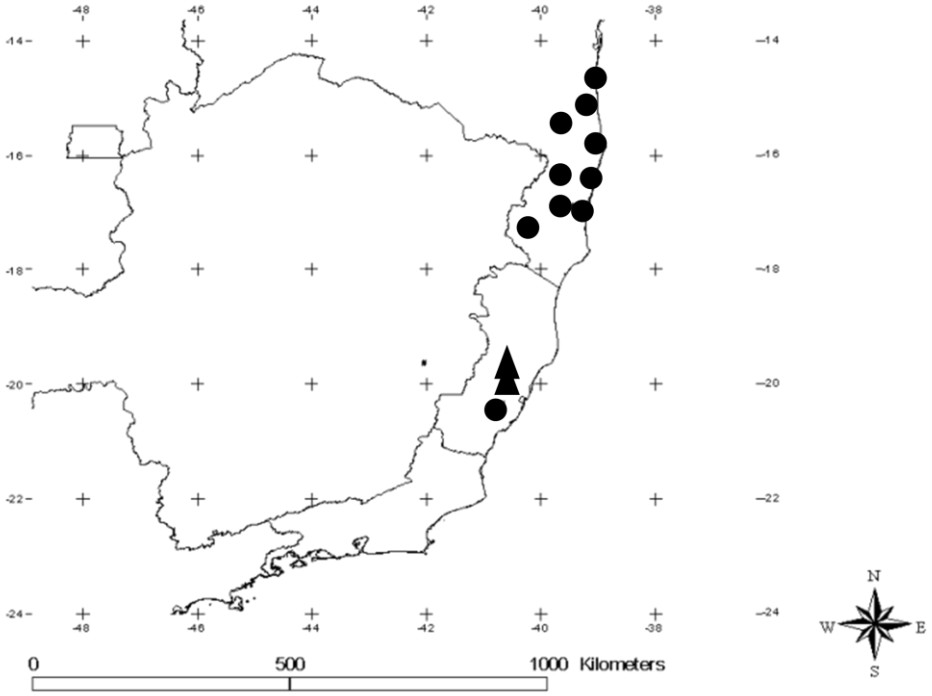

Fig. 6 – Distribution of *Herpetacanthus angustatus* (▲) and *H. longiflorus* (●).

Herpetacanthus chalarostachyus Indriunas & Kameyama, Syst. Bot. 20XX. Type: Brazil**.** São Paulo: Peruíbe, Estação Ecológica Juréia-Itatins, Núcleo Arpoador. Trilha do Morro Fernando, 23 Jun. 1994, *M. R. F. Melo, I. Cordeiro, R. J. Oliveira, M. Barros 1087* (holotype: SP; isotype: NY, SPSF, US).

Erect to sprawling branched subshrub (0.2–)0.5–1.0 m tall; stems green to brownish, subquadrate to terete, glabrate, mostly anisophyllous. Leaves glabrescent; blade elliptic, apex acute to briefly acuminate, base acute, rarely slightly oblique, the largest leaves of each node with petiole 0.5–0.6(–1.2) cm long, blade (4–)6.3–10.9(–13) × 2.9–4.0(–6.5) cm, the smallest leaves with petiole 0.3–0.6 mm, blade (2.9–)4.5–6.0(–7.5) × (1–)2.3–5.5 cm, leaves subtending the inflorescence similar to the other leaves or with vinaceous veins, petiole pubescent, blade glabrous, inconspicuously ciliate. Inflorescence mostly of one terminal and one axilary spikes on the distal node, sometimes one terminal and two axilary spikes on the distal node, rarely also on lower nodes, with only chasmogamous flowers, rarely with only cleistogamous flowers; the chasmogamous spike sometimes become a thyrsus with cleistogamous flowers growing at the axil of the bracteole of a chasmogamous flower forming a cyme with one chasmogamous and one or two cleistogamous flowers; spikes or thyrsus 1–5(–7) flowers, 1.7–4 cm long, peduncle 2–8(–10) cm long, glabrescent; rachis glabrescent; chasmogamous spikes or thyrsus, bracts sessile to subsessile, rounded to ovate, apex obtuse to acute, sometimes cuspidate, base obtuse to rounded, rarely subcordate, sometimes slightly oblique, pale green, usually with vinaceous veins, sometimes the entire surface, except the margins, becoming vinaceous, (10–)13–18(–20) × 5–10 mm, sparsely ciliate, fertile bracts slightly smaller. Bracteoles linear-lanceolate, ca. 3.0 × 0.5 mm, 2nd order bracteole smaller, hirsute. Cleistogamous spikes or thyrsus similar to chasmogamous ones, but bracts always green. Calyx segments lanceolate, ca. 4.0 × 1.0 mm, hirsute, minutely ciliate. Corolla white to pinkish, with purple or vinaceous macula, ca. 25 mm long, tube ca. 8 mm long, throat ca. 10 mm long, lower lip 4 × 3 mm, central lobe 3 × 6 mm, upper lip 8 × 7 mm, externally puberulous. Anterior stamens 5 mm long; posterior stamens 3 mm long; filaments sparsely glandular-pilose. Ovary puberulent. Style 19 mm long, sparsely glandular-pilose. Capsule 1.0–1.3 × 0.3cm, long minutely pilose. Seeds ca. 2 × 1.5 mm. (Fig. 4D-F)

Distribution and Ecology — Species endemic to the southeastern part of the state of São Paulo Brazil, growing on understory close to water courses, usually on populations of 20 to 30 individuals. (Fig. 7)
Phenology — Flowering from February to June, fruiting from Mars to September .

Selected specimens examined. BRAZIL. SÃO PAULO: Itariri, Parque Núcleo Serramar, 24º17'22" S, 47º10'27" W, 4 May 1994, *Melo et al. 1014* (UEC, SP); Eldorado, Parque Estadual de Jacupiranga, Núcleo Caverna do Diabo, Trilha do Araçá, 24º38'22" S, 48º24'01" W, 400 m elev., 22 Mar 2005, *Oriani et al. 486* (ESA, UEC, SP); Parque Estadual de Jacupiranga, Núcleo Caverna do Diabo, trilha da Cachoeira, 24º31'13" S, 48º06'29" W, 13 May 1996, *Franco et al. 1379* (SP); Juquiá, 34 km de Juquiá em direção a Tapiraí, 16 Fev 1995, *Souza. et al. 109* (SP); Peruíbe, 26 Mar 2001, *Lorenzi 2635* (HPL); id., Estação Ecológica Juréia-Itatins, Núcleo Arpoador, trilha do Fundão, descida do morro após o 2º riacho, 24º24' S, 47º01' W, 17 Sep 2010, *Indriunas 42 et al.* (SP, SPSF); alto da trilha para a praia do Arpoador, 24º23' S, 47º00' W, 18 Sep 2010, *Indriunas et al. 48* (SP, SPSF); id., trilha da Mangueira, após o riacho antes dos bambuzais, 24º23' S, 47º01' W, 18 Sep 2010, *Indriunas 49* (SP, SPSF); id., Reserva Ecológica Juréia-Guaraú, Morro do Guarauzinho, 30 Jul 1988, *Silva et al. s.n.* (SP), id., Serra do Guaraú, região do Portal da Juréia (mirante), 24º20'30" S, 47º00'70" W, 23 Jun 2009, *Moura et al. 306* (SP, SPSF); id., Núcleo Guaraú, base do Morro Fernando, 24º22'01" S, 47º19'59" W, 25 Jan 2000, *Cordeiro et al.1985* (SP).

This species resembles *H. neesianus* Indriunas & Kameyama sp. nov. differing in the inflorescence usually compound, the axis densely pilose to tomentose and usually larger leaves. The dry material is usually brown and the bracts have a shining surface.

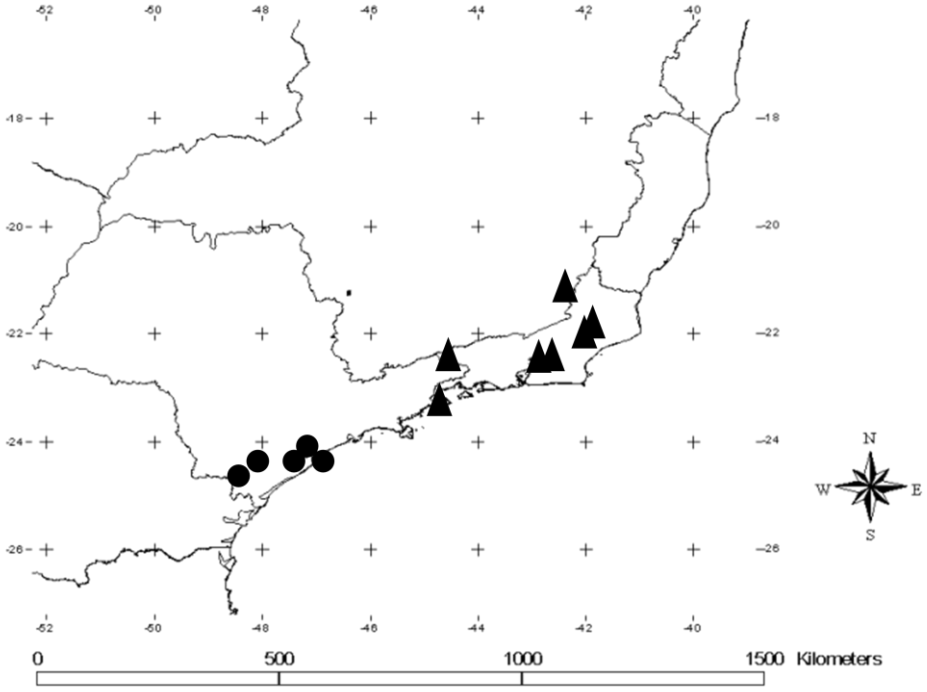

Fig. 7 – Distribution of *Herpetacanthus neesianus* (▲) and *H. chalarostachyus* (●).

Herpetacanthus delicatus Indriunas & Kameyama, Syst. Bot. 20XX. Type: Brazil. Rio de Janeiro: Parque Nacional de Tijuca, Estado da Guanabara, Vertente Norte, do Parque Nacional de Tijuca, Grajaú, 150m, 14 Apr 1972, *D. Sucre & T. Soderston 8837* (holotype: SP, isotype: RB, NY[photo]).

Branched subshrub, 20–30 cm; stems terete to subterete, glabrescent, anisophyllous. Leaves blade narrowly elliptic, apex acute to briefly acuminate, slightly mucronate, base acute, slightly asymmetric, membranaceous, densely ciliate at base and sparsely ciliate to the apex, the largest leaves of each node with petiole 0.3–1 cm long, blade 3.5–6.2 × 0.9–1.2 cm, smaller leaves with petiole 0.2–0.5 cm long, blade 2–3.5 × 0.7–1 cm. Inflorescence generally of one terminal and one axilary spikes on the distal node; 1–3 cm long, peduncle 0.3–1.0 cm long, tomentose to pubescent; rachis pubescent. Bracts

fertile mostly oblanceolate, sometimes elliptic, apex obtuse, briefly cuspidate, base cunaete, 7–10 × 2–4 mm, almost glabrate, sparsely ciliate, bracts sterile elliptic, apex obtuse, briefly cuspidate, base obtuse, 8–12 × 3.5–5.5 mm, almost glabrate, sparsely ciliate. Bracteoles lanceolate, ca. 2–3.5 × 0.25 mm, margin hirtellous. Calyx segments lanceolate, 2–3 × 0.25 mm, margins hirtellous. Corolla, white with vinaceous macula on the throat, ca. 13 mm, tube 4 mm, throat 0.5, lower lip with lateral lobes ca. 1.8 × 1.5 mm, central lobe 2.5 × 2 mm, upper lip 4 × 2.5 mm, puberolous. Anterior stamens ca. 3 mm long; posterior stamens ca. 2 mm; filaments sparsely pilose. Ovary glabrous. Capsule ca. 1 × 0.1 cm. Seeds ca. 2 × 1.5 mm.

Distribution and Ecology —. Know only from an urban Forest reserve in the city of Rio de Janeiro. (Fig. 8)
Phenology —.Flowering and fruiting in April.

Selected specimens examined. BRAZIL. **RIO DE JANEIRO:** Rio Branco, Grajaú, 28 Apr 1946 *Emygdio, L. 464*; (R) 21 Apr 1946 *Emygdio, L. 451*; (R)

It resembles *H. melancholicus* Nees & Mart., whose habit is similar, but from which it can be distinguished by the ciliate bracts, the sterile ones elliptic and the fertile oblanceolates, and leaves with narrow-elliptic blades up to 2 cm wide, in *H. melancholicus* bracts are sparsely ciliate, widely ellipitc to rounded and leaves blades are ovate, elliptic or oblong, 4 to 10 cm wide.

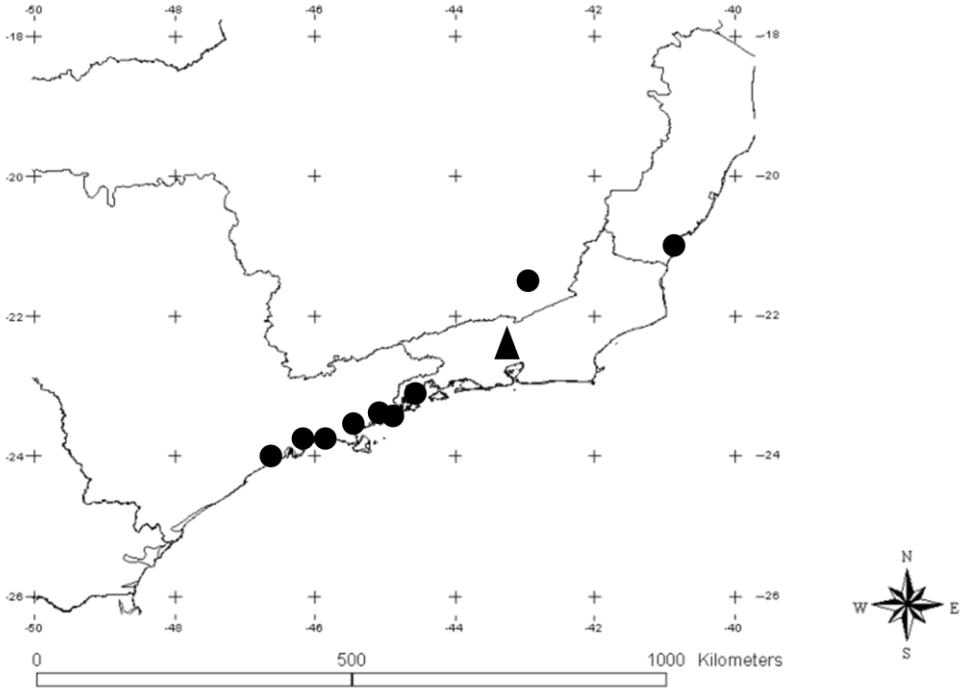

Fig. 8 – Distribution of *Herpetacanthus delicatus* (▲) and *H. rubiginosus* (●).

Herpetacanthus longiflorus Moric. Pl. Nouv. Amér. 159. Mar 1847. Tab. 93. Type: Brazil. Bahia: partie meridionele, *J. S. Blanchet 3130A* (lectotype, here designated: G sheet 236270 [photo]; isolectotype: G, sheet 222636 [photo], W [photo])

Subshrub to shrub 0.5–2 m, glabrescent, anisophylous. Leaves ovate, elliptic to oblong, apex acute to acuminate, base acute, decurrent, rarely obtuse, sometimes oblique, larger leaves with petiole (1.2–)1.5–2.5(–2.8) cm, blade (10.5–)13–25×(2.8–)3.2–8(–9.3) cm, smaller leaves with petiole (0.7–)1–2(–2.5) cm long, blade (8.8–)10–19.5(–25)×(2.7–)3.2–7.2(–8.8) cm, petiole mostly puberolous, blade glabrescent, usually with trichomes on the veins, often short ciliate, especially on the base of the blade. A terminal and two axilary spikes (or thirsus) on distal nodes and with 2nd order branching, rarely 3rd order, rarely a solitary terminal spike (or thirsus), 5–15 cm long long, peduncle ca. 0.5–1.5 cm long, pubescent, trichomes brownish. Bracts greenish, whitish, liliac to purple, ovate to elliptic, ca. 1.4×7 mm, pubescent, specially on the veins, long ciliate with glandular and eglandular trichomes, sometimes with only minute trichomes. Bracteoles linear-lanceolate to lanceolate, (0.7–)1.2–1.5×0.25–0.8(–1) cm, 2nd order bracteole smaller, pubescent, ciliate. Calyx segments linear-lanceolate to lanceolate, 3–5×0.5 mm. Corolla lilac, purplish or whitish, ca. 3 cm, tube ca.1.3 cm, throat ca.0.8 cm, lower lip with lateral lobes, 10×2 mm , central lobe, 10×3 mm, upper lip wide-lanceolate, ca. 9 × 4 mm, densely pilose. Anterior stamens 10 mm long; posterior stamens 8 mm; filaments sparsely glandular-pilose. Ovary glabrescent. Style 2.5–4 cm, often base hirsute, apex glabrous. Capsule ca. 2.2 cm, pubescent. Seeds 2.5×2 mm. (Fig. 9B)

Distribution and Ecology — In the state of Bahia from Ilhéus southwards to Porto Seguro, in well preserved and disturbed forest, on silicate clay and sandy soils. (Fig. 6)
Phenology—.Flowering and fruiting from January to October.

Selected specimens examined. BRAZIL. **BAHIA:** Eunápolis, Rodovia, BR 5, 16km S. Plantação de Cacau, 22 Sep 1966 *Belém & Pinheiro 2611* (IAN, NY, RB) Canavieiras, Ramal a 21 km na rodovia Canavieiras/Una (BA 001). Ramal da Fazenda Campo Lúcio, 15º40'31" S, 38º56'50" W, 4 June 1981 *Hage & Santos 883* (MBM**,** RB**,** US) Una, Reserva Biológica do Mico-Leão, Entrada no km 46 da Rodovia BA 001 Ilhéus/Una. Coletas feitas na Picada da Bandeira, 15º09' S, 39º06' W, 25 July 1996 *Santana et al. 606* (MBM**,** NY**,** US) Porto Seguro, Parque Nacional de Monte Pascoal, 16º53'60" S,

39º24' W, 13 Jan 1992 *Hatschbach & Barbosa 57032* (MBM) Canavieiras, Fazendo Gromogô. Km 22 da Rod. Canavieiras/Santa Luzia (BA 270), ramal à direita, 2 km a dentro, 15º40'31" S, 38º56'50" W, 21 Jul 1981 *Mattos-Silva et al. 1316* (MBM) 5 a 6 km SW de Olivença, na estrada que liga Olivença ao povoado do Maruim, 10º44'16" S, 37º04'54" W, 29 Jul 1993 *Jardim et al. 236* (HUEFS, MBM, RB, SP, SPSF, US) Parque Estadual de Monte Pascoal, 16º53'60" S, 39º24' W, 3 Oct 1966 *Belém & Pinheiro 2702* (IAN, RB) Ilhéus, Estrada Olivença-Marium, entre os km 7 - 10, 14º47'21" S, 39º02'57" W, 50-19 May 1985 *Martinelli et al. 11104* (RB) 5-6 km SW de Olivença, na estrada que liga Olivença ao povoado do Maruim, 14º47'21" S, 39º02'57" W, 16 Jul 1991 *Santana et al. 01* (MBM, NY, RB, SPF) Porto Seguro, Parque Estadual de Monte Pascoal, 6 Apr 1972 *Pinheiro 1819* (US) Parque Nacional de Monte Pascoal, along road from entrance to visitor's center and road to E side of park, 16º52'02" S, 39º11' W, 50-5 Feb 1999 *Thomas 11981* (NY, US) Parque Nacional de Monte Pascoal, 15 Jan 1973 *Santos 2690* (US) Jaguaquara a Apuerema, 4 Oct 1972 *Pinheiro 1979* (US) Saída de Itabela - Guaratinga, 13 Sep 1968 *Almeida & Santos 18* (US) Porto Seguro, Parque Estadual de Monte Pascoal, Praça Céu Azul, 26 Feb 1981 *Souza 330* (GUA) Porto Seguro, Parque Estadual de Monte Pascoal, 16º27'03" S, 39º03'52" W, 23 Jun 1967 *Sobrinho & Castellanos 1478* (HRB, MBM, US) Monte Pasqual, 16º53' S, 39º11' W, 7 Aug 1991 *Bianchini 285* (SPF) Parque Nacional de Monte Pascoal, Área limite entre PARNA e a reserva indígena Barra Velha, da tribo Pataxó, 16º53'60" S, 39º24' W, 13 Aug 1998 *Amorim et al. 2531* (MO, NY, US) Porto Seguro, Parque Nacional de Monte Pascoal, 21 Mar 1968 *Vinha & Santos 94* (RB, US)

Herpetacanthus longiflorus is distinct from all other species by the long and densely pilose corolla up to 3 cm. It generally has many spikes with many flowers. In Herbarium G there are two exsicates Blanchet 3130A (sheets 236270 and 222636), so we chose sheet 236270 as a lectotype because it is more complete. There is another Blanchet's collection of *H. longiflorus* number 3130 without the "A" (sheet 222069), about which we cannot be sure that it is a type.

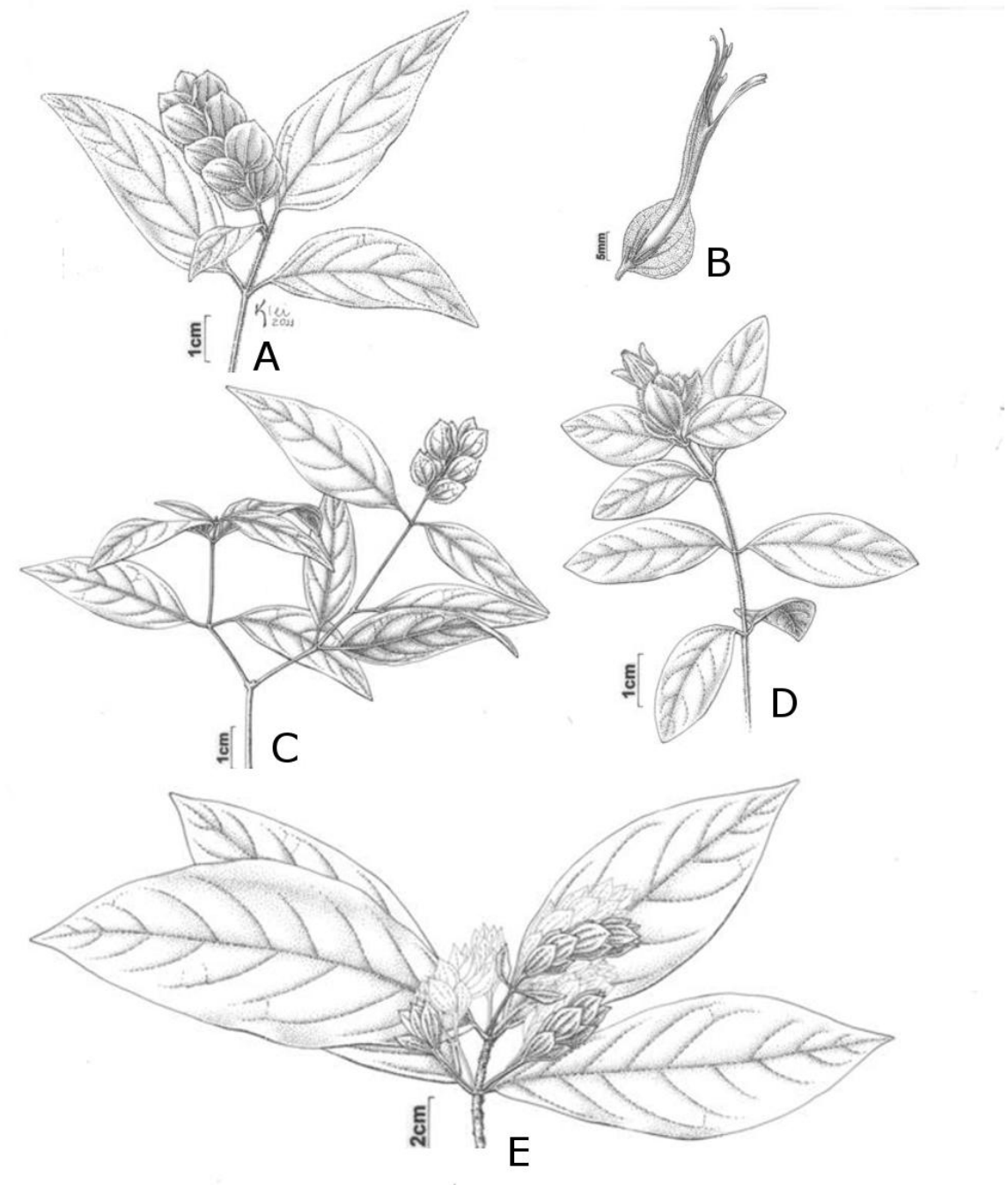

Fig. 9. A. *Herpetacanthus melancholicus* var. *melancholicus*. B. *H. longiflorus*. C. *H. melancholicus* var. *latifolius*. D. *H. rubiginosus*. E. *H. macrophyllus*. (A – *Thomas 11940*; B. – *Mattos Silva et al.1316*; C. – *Araujo 9999*; D – *Cordeiro et al. 2332*; E – *Fernandes 1605*)

Herpetacanthus longipetiolatus Indriunas & Kameyama, Syst. Bot. 20XX. – Type: Brazil. Espírito Santo: Município de Águia Branca, Águas Claras. Zequinha, alt.: 350-450 m/s.m. 18º52'32"S e 40º48'52"W, 15 Aug 2007, *R. R. Vervloet, E. Demuer, E. Bause & T. A. Cruz 3174* (holotype: MBML; isotype: RB).

Erect subshrub, ca. 0.5 m tall; stems pale green, hexagonal to subquadrate or furrowed, puberolous, anisophyllous. Leaves long petiolate; blade ovate, apex acute to briefly acuminate, base obtuse, abruptly shortly decurrent, oblique, slightly discolor, the largest leaves of each node with petiole ca. 5.5 cm long, blade 8.5(–9.0) × 4.2(–5.5) cm, the smallest ones with petiole ca. 4.5 cm long, blade (2.2–)4.5 × 3.2 cm; leaves subtending the inflorescence similar to the other leaves, petiole abaxially pubescent, adaxially tomentose, blade glabrescent, ciliate. Inflorescence of one terminal and one axilary spikes on distal nodes; 2–4 cm long, peduncle ca. 0.5 cm long, tomentose. Bracts green, sessile to subsessile, ciliate, with patent glandular and eglandular trichomes of two different sizes, ca. 0.3–1.0 mm, blade pubescent with the same type of trichomes; fertile bracts widely elliptic, apex acute to acuminate, base acute, oblique, ca. 10–15 × 5–8 mm, pubescent, minute patent eglandular and sparsely glandular trichomes on both surfaces; sterile bracts widely elliptic, apex obtuse acuminate, base obtuse to rounded, oblique, 15–18 × 11–15 mm. Bracteoles linear, ca. 3–6 × 0.5 mm, hirsute, trichomes minute. Calyx segments lanceolate, hirsute, ca. 4.5 × 0.5 mm, ciliate. Corolla white, pink-lined, externally puberulous, ca. 15 mm, tube 5 mm, throat 5 mm, lower lip 2 × 2 mm, central lobe 2.5 × 3 mm, upper lip ca. 5 × 4 mm. Anterior stamens 4 mm long; posterior stamens 3 mm; filaments sparsely glandular-pilose. Ovary glabrous. Style 15 mm long, sparsely pilose at the base. Capsule ca. 1 × 0.2 cm, pubescent. Seeds ca. 2 × 1.5 mm.

Distribution and Habitat — Known only from a single collection from Águia Branca, in the state of Espírito Santo, Brazil. Elevation 350-450 m. (Fig. 10)
Phenology — flowering in August.

Herpetacanthus longipetiolatus is presently known by a single collection from Espírito Santo State, Brazil, but its long petiole (almost as long as blade) is unique in the genus. Its prominently anisophyllous, leaves with conspicuously asymmetric base and ciliate margin are other remarkable diagnostic characters.

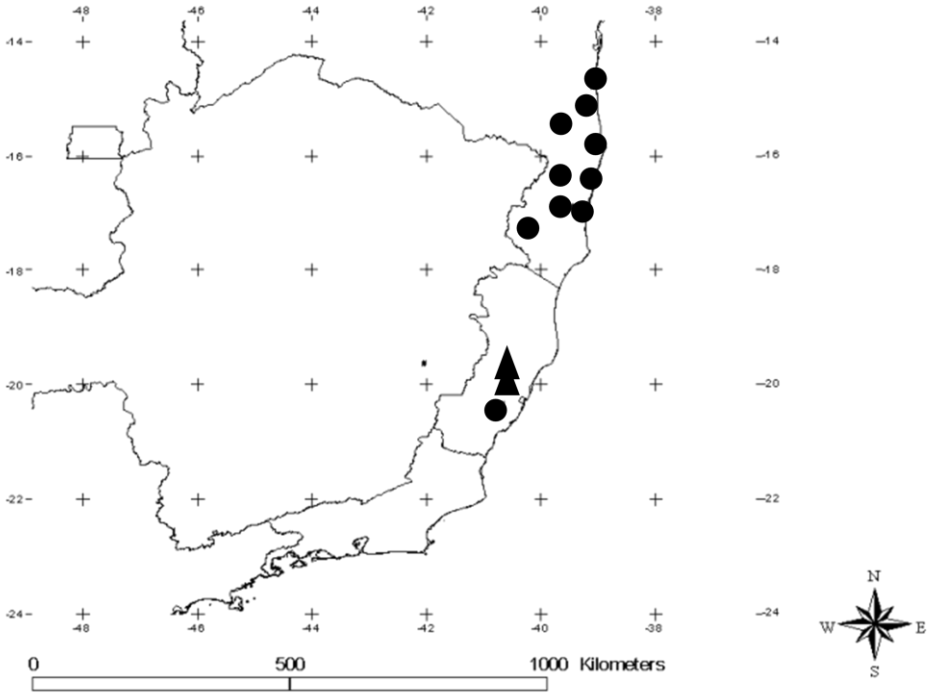

Fig. 10 – Distribution of *Herpetacanthus longipetiolatus* (▲), *H. macrophyllus* (●) and *H. tetrandrus* (■).

Herpetacanthus macrophyllus Nees in Mart., Fl. bras. 9: 5. 1847. – Type: Brazil. Espírito Santo: Santa Teresa, Estação Ecológica Santa Lúcia, 7 Nov 1985, *H. Q. B. Fernandes 1605* (neotype, here designated: MBML; isoneotype: RB, US).

Erect subshrub, rarely branched, 0.15–0.35 m tall; stems pubescent, slightly anisophylous. Leaves sessile to subsessile, rarely with evident petiole, blade elliptic to ovate, mostly large elliptic, apex acute to obtuse, sometimes slightly acuminate, base cuneate- attenuate, cuneate- attenuate-truncate, sometimes obtuse or subcordate, cartaceous, 10.5–20(–28.5) × (3.5–)4.5 × 8.5(–9) cm, glabrous, except for some trichomes at the margin base. Inflorescence one terminal and usually two axillary spikes on the distal node, sometimes also on lower nodes; 1.7–4 cm long, peduncle ca. 4 cm long, glabrous; axis glabrous. Bracts subsessile, elliptic, apex acute to acuminate, base obtuse, slightly oblique, green, sometimes with vinaceous macula, ca. 20 × 10 mm,

fertile bracts usually smaller, glabrescent. Bracteoles lanceolate to narrowly elliptic, ca. 15 × 0.75 mm, glabrescent, long ciliate. Calyx segments lanceolate, ca. 4 × 0.5 mm, sparsely puberulent and ciliate. Corolla white, ca. 20 mm, tube ca. 7 mm, throat ca. 10 mm, lower lip 5 × 3 mm, central lobe 3 × 5 mm, upper lip 7 × 5 mm, externally glabrous, except for some sparse trichomes on the lobes apex. Longer stamens ca. 5 mm long; shorter stamens 2 mm; filaments sparsely glandular-pilose. Ovary glabrous. Style ca. 14 mm. Capsule ca. 1 cm, glabrous. Seeds ca. 2 × 2.5 mm. (Fig. 4G, 9E)

Distribution and Habitat — All the specimens are found in Santa Tereza area, Espírito Santo State, in wet areas of the rain forests. It grows in shadow places. (Fig. 10)
Phenology – Flowering and fruiting from November to January, also found with flowers in July.

Selected specimens examined. BRAZIL. **ESPÍRITO SANTO:** Cariacica, Reserva Biológica de Duas Bocas, Trilha da Represa, 20º16'22" S, 40º28'36" W, 200-21 Aug 2008 *Amorim et al.7613* (MBML); Santa Tereza, Santo Anselmo, Terreno de M. Nandolfo, 850-24 Feb 2006 *Kollmann et al 8695.*(MBML); id., Estação Biológica Santa Lúcia, Trilha do Túmulo do Augusto Ruschi. Entre o penúltimo e o último pontilhão, 19º58'22" S, 40º31'47" W, 570-8 December 2009 *Indriunas et al. 27* (MBML**,** SP) id, id, id, descida do rio, 19º58'22" S, 40º31'47" W, 570-8 Dec 2009 *Indriunas et al. 28* (MBML, SP) id., id., id. próximo a trilha, 19º58'22" S, 40º31'47" W, 570-8 Dec 2009 *Indriunas et al. 29* (SP); Santo Henrique, beira de estrada, 26 Jan 2005 *Kollmann et al. 7321 (*MBML) Santa Leopoldina, Cachoeira Véu da Noiva, 20º02'55" S, 40º32'16" W, 300-435 17 Jan 2008 *Pereira et al. 1575*; (RB, SP, US).

The specie can be recognized by the large subsessile leaves and the cuneate-attenuate-truncate base. The specimens usually have a considerable amount of soil and fragments of litter glued on the stem especially at the distal part, giving a 'dirty' aspect, it's hard to take off the accumulated material, in living or dried material. *H. macrophyllus* holotype is a Sellow collection from Herbarium B, with no informations about locality and date, this material was destroyed and only photographs can be analized. No duplicates or putative duplicates were found, so we selected the most similar material to the holotype as a neotype.

Herpetacanthus magnobracteolatus Indriunas & Kameyama, Syst. Bot. 20XX. – Type: Brazil**.** Bahia: Juquié Serra do Brejo, Fazenda do Sr. Francisco Brito, 12º15'22" S, 39º05'58" W, 7 Sep. 2008, *A. L. Côrtes, P. L. Ribeiro, F. L. Ribeiro 116* (holotype: HUEFS).

Branched subshrub, 0.5–1.0 m tall; stems terete, green, glabrescent, anisophyllous. Leaves elliptic to ovate, rare oblong, apex acute to briefly acuminate, mucronulate, base acute to cuneate, sometimes obtuse or decurrent, slightly oblique, blade slightly discolor, membranaceous to charteceous, glabrous, sometimes upper surface hirsute along the midrib, inconspicuously ciliate, the largest leaves of each node with petiole 0.3–0.6(–0.8) cm long, blade 4–8(–9.5) × 1.6–4.5 cm, the smallest ones with petiole 0.3–0.7 mm long, blade 1.7–5.5(–7) × 1–3 cm, leaves subtending the main inflorescence similar to the other leaves. Inflorescence generally a single terminal spike, rarely with axillary spikes at distal nodes; 2–4 cm long, peduncle 0.3–0.5 cm long, glabrescent; rachis glabrescent. Bracts fertile and sterile similar, sessile to subsessile, elliptic to ovate, apex acute, base obtuse, pale green, green with pinkish margin or purplish; (10–)13–20 × 8–10 mm, glabrescent, ciliate. Bracteoles elliptic, apex acuminate, (6–)1–1.5 × 0.2– 0.5 mm glabrous, sometimes with sparse minute trichomes on the midrib, ciliate. Calyx segments lanceolate, ca. 5.5 × 0.5 mm, hirsute, ciliate. Corolla white to creamy white, tinged magenta distally, lilac macula at lobes base, puberulous, ca. 1.3 cm, tube 6 mm, throat 1.5 cm, lower lip 5 × 3.5 mm, central lobe 5 × 4 mm, upper lip 8 × 7 mm. Anterior stamens 2 mm long, posterior stamens 1 mm long. Ovary glabrous. Style ca. 7 mm, glabrous. Capsule 0.8–1.2 × ca. 0.3 cm, glabrous. Seeds ca. 2.5 × 2 mm. (Fig. 4 H-I)

Distribution and Ecology — This the only species from eastern Brazil that occurs in a moist deciduous forest (Mata de Cipó), with rainfall between 800 – 1000 mm/year and a well defined rainy and dry period (Thomas 2003). This type of vegetation is not part of the Atlantic Forest, but can be consider a transition between the wet Atlantic Forest and the caatinga a drier forest. It grows in the understory. (Fig. 11)
Phenology — Flowering in September, fruits from April to September.

Selected specimens examined. BRAZIL. **BAHIA:** Maracás, Fazenda dos Pássaros. BA 250 (=BA 554 na carta ao milionésimo), a 24 km a E de Maracás, 900 m elev., 13 Jul.

1979, *Mori & King 12181* (RB); id., ca. de 6-8 km da cidade, na estrada do Cruzeiro, 13º23'48" S, 40º21'54" W, 1002 m elev., 23 Apr. 2002, *Souza et al. 198* (HUEFS); Jequié, Serra do Brejo, Fazenda of Francisco Brito, 10.5 km S of Mandacara on road to Serra do Brejo (road that goes past stadium), 13º56'49" S, 40º06'40" W, 600-700 m elev. 26 Jul. 2003, *Thomas et al. 13602* (SPF).

This species can be recognized by the elliptic bracteoles grow up to ¾ of bract size during fruit development. Leaves are somewhat cartaceous, more rigid than the leaves of other species. Information about the corolla were supplied by Côrtes (personal communication), because there were only a fragment of is in the material examined

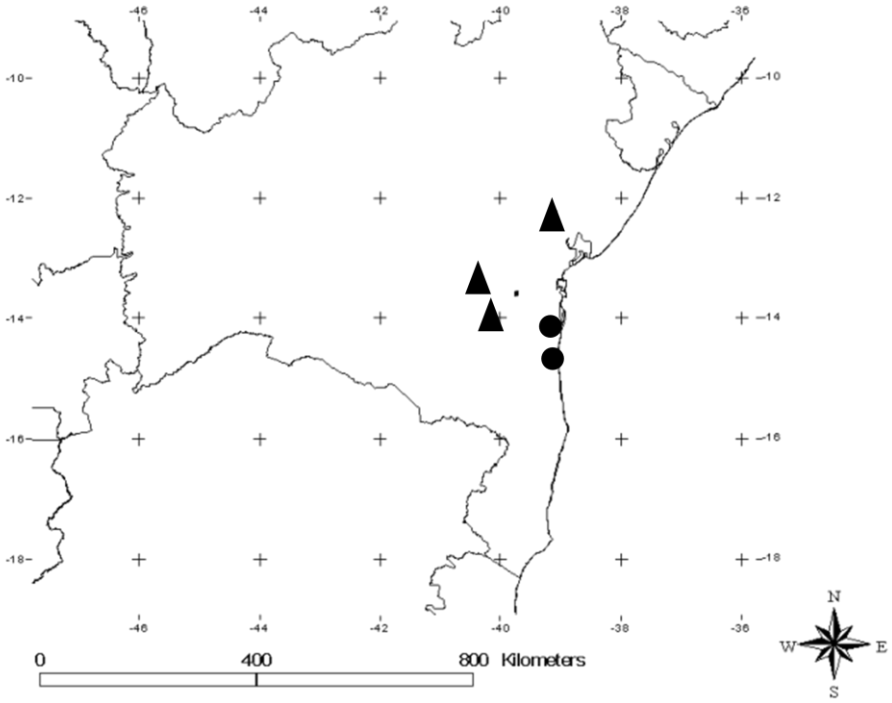

Fig. 11 – Distribution of *Herpetacanthus magnobracteolatus* (▲) and *H. strongyloides*(●).

Herpetacanthus melancholicus Nees & Mart. In Mart. Fl. Bras. 9: 96. 1847. Type: Brazil. Bahia: "in silvis primaevis ad viam Felisbertiam", *M. A. P. Wied-Neuwied 18*. (holotype: BR [photo]).

Branched subshurb, 0.5–1 m; stems terete, glabrescent, slightly anisophyllus. Leaves lanceolate to ovate, sometimes elliptic or oblong, apex acute to obtuse, sometimes acuminate, base obtuse, rarely slightly oblique, petiole (0.3–)0.5–1.3(–2) cm long, blade (3.7–)5–10 × 1.2–3 cm, (4–)5(–6) pairs of secondary veins, glabrescent, sparsely ciliate. Inflorescence a terminal and two axilary spikes on the distal node, sometimes also on lower nodes; 1–3.5 cm long, peduncle 0.2–0.7 cm long, usually hirsute with whitish trichomes. Bracts mostly pale green, short pedicelate, ca. 1 mm, rounded, widely elliptic to obovate, apex cuspidate or retuse cuspidate, base obtuse or rounded, ca. 10–15 × (7–)9.5–15 mm, sparsely pilose, mostly hirsute on the mid ribs, ciliate. Bracteoles linear-lanceolate to lanceolate, ca. 5–7 × 0.5–1 mm, glabrescent, with patente trichomes, ciliate with sparsely long trichomes. Calyx segments linear, ca. 5 × 0.5 mm, scabrous, ciliate. Corolla matures not seen, buds densely pilose. Capsule ca. 1 cm, puberolous. Seeds ca. 2.5 × 2.5 mm.

Nees (1847a) described two varieties to *H. melancholicus*: α) var. *angustifolius*, which is actually the type variety, and β) var. *latifolius*. The varieties can be distinguished as showed bellow.

Key to varieties of Herpetacanthus melancholicus

Leaves mostly narrow elliptic to lanceolate, often glabrescent; bracts sterile and fertile rounded, equal, ca. 15 × 15 mm …….. var. *melancholicus*

Leaves mostly elliptic to ovate, often glabrate, bracts sterile usually elliptic, smaller ca. 10×8 mm and fertile usually rounded, ca. 10 × 10 mm ……. var. *latifolius*

Herpetacanthus melancholicus **var.** melancholicus **as '*angustifolius*' Nees & Mart. In Mart. Fl. Bras. 9: 96. 1847.**

Distribution – .This variety grows in wet forests on southern Bahia. (Fig. 12)

Selected specimens examined. BRAZIL. **BAHIA**: Cairu, Ilha de Boipeba, 13º37'45" S, 38º55'48" W, 55 m, 16 Sep 2007 *Perdiz et al. 136* (SPF); Jussari, 15º08'30" S, 39º34'30" W, 300-450 m, 2 Feb 1999, *Thomas. et al. 11940* (NY**,** US); Una, 15º17' S, 30º01' W, 26 Jan 1977, *Harley et al. 18279* (NY), 1º17'50" S, 30º01' W, 26 Jan 1977, *Harley et al. 18279* .(UEC, US)

This variety is characterized by the branched stems, the leaves are narrow elliptic to lanceolate, and often glabrescent with whitish trichomes mostly on the petiole and blade base; the bracts are somewhat equal, usually rounded, ca. 15 × 15 mm. (Fig. 9A)

Herpetacanthus melancholicus **var.** latifolius **Nees & Mart. In Mart. Fl. Bras. 9: 96. 1847. Type: Brazil. Rio de Janeiro: "Tocaia", Schott. (holotype: W [photo]).**

Distribution – This variety grows in sand vegetation (restinga), close to the beach. (Fig. 12)

Selected specimens examined. BRAZIL. **RIO DE JANEIRO:** Saquarema, Praia do Jaconé, 30 May 1978, *Martinelli 4513* (RB), 30 May 1978 *Martinelli 4513*; (GUA), Reserva Ecológica Estação Jacarepiá, 12 May 1994, *Araujo et al. 10027A* (GUA).

This variety differs from *H. melancholicus* var. *melancholicus* by it less branched habit, leaves often elliptic to ovate, often smaller and unequal bracts, sterile ones usually elliptic, ca. 10×8 mm fertile ones usually rounded, ca. 10 × 10 mm. (9 C)

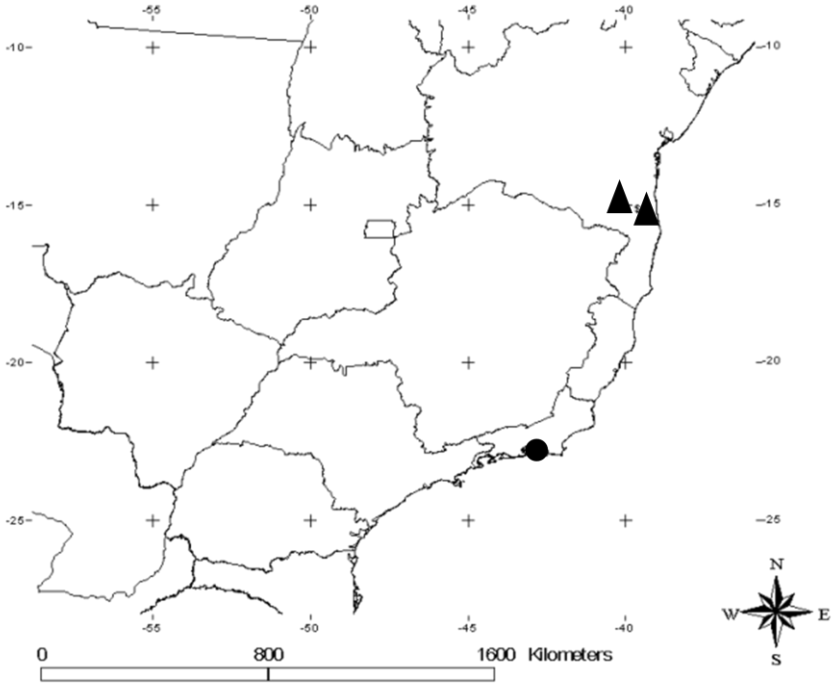

Fig. 12 – Distribution of *Herpetacanthus melancholicus* var. *melancholicus* (▲) and *H. melancholicus* var. *latifolius* (●).

Herpetacanthus neesianus Indriunas & Kameyama, Syst. Bot. 20XX. Type: Brazil. Rio de Janeiro: Área de Proteção Ambiental Cairuçu, Trilha para a pedra rolada, 300m, 28 Jun 1995, *M. G. Bovini, M. C. M. Marques, R. Marquete, et al. 833* (holotype: SP; isotype: RB).

Erect branched subshrub, (0.3-)0.5 – 1.0(-1.5) m. Stems green, puberulous to glabrescent, usually anisophyllous. Leaves membranaceous to cartaceous, petiole glabrous or sparsely pilose, blade ovate to elliptic, apex acute to acuminate, base acute, usually long narrowly decurrent, rarely slightly oblique, inconspicuous glabrescent, commonly with some sparsely trichomes at the base of the midrib, ciliate; the largest leaves of each node with petiole (0.3–) 0.5-0.8 (– 2.2) cm long, blade (5.2 –)8–18 (–21)×(2.2–)2.5 – 6 (–7.3) cm, smallest leaves with petiole (0.2–)0.3-1(– 1.5) cm long,

blade (3.1–) 5 –17(–19.5)×(0.9–)1.5–5.5 (–7) cm. Inflorescence of one terminal and two axilary spikes or thyrsus on distal nodes, sometimes with 2nd order branching, rarely 3rd order, 2 – 8 cm long, peduncle 2 – 6 cm long, densely pilose to tomentose, rachis puberolous to pubescent. Bracts sessile to subsessile, pale green, whitish to white, rarely pinkish, sometimes with a vinaceous macula, membranous, elliptic, narrowly elliptic to rounded, ovate or obovate (specially the upper ones), apex acute, acuminate to abruptly acuminate, base obtuse to rounded, 1.3- 2.5 × 0.8– 1.7 cm, sterile bracts usually smaller, glabrescent, with sparsely trichomes along the veins, ciliate, with different sizes of eglandular trichomes up to 1mm, and rarely with minute glandular trichomes. Bracteoles linear-lanceolate, ca. 5–10×0.3– 0.5 mm, glabrescent, ciliate, 2nd order bracteoles much smaller. Calyx segments lanceolate, ca. 5 × 0.5(-0.7) mm, glabrescent, ciliate. Corolla purple to whitish, sometimes pinkish inside, sparsely pilose, ca. 3 cm, tube ca. 1.5 cm, throat 0.9 cm, lower lip with lateral lobes 2.5×1.5 mm, central lobe 3 × 4 mm, upper lip 5 × 2.5 mm. Anterior stamens ca. 7 mm long; posterior stamens 5 mm; filaments glabrous. Ovary 1.5 × 0.5 mm, glabrescent, style ca. 4 cm long, glabrous. Capsule ca. 1,5× 0.2 cm, glabrous, except for minute trichomes sometimes at the apex. Seeds ca. 2.5 × 2–2.5 mm. (Fig. 13 A-B)

Distribution and Ecology — This species occurs from northeastern São Paulo to Rio de Janeiro, some individuals were found in Minas Gerais State. The species usually grows in the understory of well preserved or disturbed areas. (Fig 7)
Phenology **–** flowering from March to November, fruiting mostly from June to August.

Selected specimens examined. BRAZIL. **MINAS GERAIS:** São José do Batatal, Tombos do Carangola, Jul. 1888, *Schwacke s.n.* (R); São Paulo de Muriaé (old name of Muriaé), Jul. 1880, *Mello Neto s.n.* (R); **RIO DE JANEIRO:** Muriáe, Área de inundação da Usina Hidroelétrica de Cachoeira Encoberta, ás margens do Rio Glória, 18 Apr. 1998, *Salino et al. 4185* (US); Rio de Janeiro: Santa Maria Madalena, Tamborim, March 1937, *Lima. 48* (RB, SP); id., beira da Rodovia RJ 182, da fonte de Visconde do Imbé para Conceição de Macabu, 22º02'42" S, 41º58'24" W, 423 m elev., 22 Jun. 2005, *Lorenzi et al. 5446* (IAC); Magé, 28 Aug. 1982, *Guedes 163* (RB, SP); id., 6 Aug. 1983, *Guedes et al. 322* (RB, SP); Serra dos Órgãos, barreira do Soberbo, 14 Jun. 1946, *Araújo s.n.* (RB); id., Barreira-Fagundes, 12 Aug. 1948, *Pereira 605* (HRB, RB, US); Guapimirim, Granja Monte Olivete, margem do Rio Bananal, 22º32'14" S, 42º58'55" W,

350-400 m elev., 18 Aug. 1993, *Braga 510* (RB); Itatiaia, Lote 17, 22º29'46" S, 44º33'47" W, 900 m elev., May 1950, *Brade et al 20337* (RB); Paraty, Morro da Pedra Solada, dentro da mata, próximo ao bambuzal, depois do córrego, 23º18'50" S, 44º44'30" W, 148 m elev., 8 Jun. 2005, *Silva-Castro et al. 1016* (HUEFS); id., Área de Proteção Ambiental Cairuçu, terrestre às margens da trilha, 260 m elev., 11 May 1991, *Sylvestre et al. 523* (RB); id., id., trilha para o Morro da Pedra Rolada, 180 m elev., 28 Jun. 1995, *Boruche 10 et al.* (RB, SP); id., id., Morro do Córrego dos Micos, 160 m elev., 26 Nov. 1994, *Giordano et al. 1797.* (RB, SP); id., cerca 16 km do Trevo de Parati, entrada à direita da BR 101, antes da ponte, mata próxima ao Córrego dos Micos, 23º13'04" S, 44º42'46" W, 90-500 m elev., 1 Jul. 1993, *Konno et al. 213* (RB, SP); id., Morro do Carrapato, 250 m elev., 30 Aug. 1994, *Bovini et al. 529* (RB); id., Ponta Negra. Caminho para a Praia dos Antigos, ao longo da trilha, 8 Jun. 1994, *Reis 181* (SP); id., Fazenda Paraty Mirim, Propriedade da Flumitur, 29 June 1977, *Almeida et al. 264* (RB, SP); **SÃO PAULO:** Caraguatatuba, Parque Estadual da Serra do Mar, Núcleo Caraguatatuba. Trilha da Poção, é muito comum nas trilhas da Mococa e do Tropeiro, 23º37'14" S, 45º24'47" W, 9 Sep. 2000, *Bianchini 1457 et al.* (SP, SPSF).

Herpetacanthus nessianus is similar to *H. longiflorus* in the long corolla, they can be distinguished by the shorter, sparsely pilose bracteoles up to 1 cm and corolla with a well distinct and wider throat area, *H. longiflorus* has longer, ca. 1.5 cm, and pilose bracteoles, narrower and almost undistinguishable throat area, i.e., the basal tube and the throat have almost the same width.

Fig. 13 – Species of *Herpetacanthus*. A and B. *H. neesianus*. A. Habit. B. Inflorescence. C and D. *H. rotundatus*. C. Habit. D. Inflorescence. E – K. *H. rubiginosus*. E and F. Habit. G. Inflorescence and leaves variegation. H. Inflorescence. I. Young stems trichomes. J and K. Inflorescence. (Photos by: A and B – *H. Lorenzi*. C and D. *C. Pessoa*. E – I – *C. Kameyama*. J and K – *E. Gressler*.

Herpetacanthus panamensis Leonard, J. Wash. Acad. Sci. 32: 185. 1942. Type: Panamá. In deep shade in the Chaguinola Valley, 14 Mar 1924, *A. A. Dunlap 554* (Holtype: US [photo], isotype: F [photo]).
Standleyacanthus costaricanus Leonard, Ceiba 3: 143. 1952. Type:Costa Rica. in wet forest in the vicinity of Guápiles, province of Límon, Mar 12-13 1924, *P. C. Standley 37026* (holotype: US n.v.).

Subshrub 0.25–1 m, stems terete to subquadrate, young stems usually vinaceous, glabrescent, slightly anisophylous. Leaves elliptic to ovate, apex acute to acuminate, base obtuse, petiole 0.2–1(–1.5) cm long, 4–15.5×2.2–6.2 cm, glabrescent especially at the base. Inflorescence a terminal and two axilary spikes on the distal node, sometimes also on lower nodes, 1.5–5 cm long, peduncle 0.3–1 cm long, glabrescent. Bracts mostly green, ovate to elliptic, apex acute, base acute, ca. 12×6 mm, glabrate, sparsely ciliate to ciliate. Bracteoles mostly lanceolate, 5–8×1–3 mm, sometimes sparsely ciliate. Calyx segments lanceolate, ca. 4×0.5 mm, rarely minutely ciliate. Corolla ca. 1.7 mm, tube ca. 7 mm, throat ca. 5 mm, lower lip with lateral lobes 3×2 mm, central lobe 3×4 mm, upper lip ca. 5×4 mm. Longer stamens ca. 3.5 mm long; shorter stamens 2 mm; filaments sparsely glandular-pilose. Ovary glabrate. Style 13 mm, often base hirsute, apex glabrous. Capsule ca. 1 cm, glabrate. Seeds 2.5×2 mm. (Fig. 3A)

Distribution and Ecology – Honduras (Daniel 2005), Nicaragua, Costa Rica, and Panama, in wet well preserved and disturbed inundate and noninundate Forests and cocoa plantations, from 10 to 1300 m elevation. (Fig. 14)

Selected specimens examined. NICARAGUA. **ZELAYA:** SW of Bluefields, from cemetary along road to new airstrip, 12º00' N, 83º46' W, 10-40 2 Apr 1981 *Stevens & Krukoff s.n.* (MO).
COSTA RICA. **SAN CARLOS:** Alajuella, Villa Guesada, 850-10 Mar 1940 *Smith P2575* (NY) **HEREDIA:** Finca La Selva and Puerto Viejo de Sarapaquí, 6 Aug 1967 *Weston & Weston 4971* (US), La Selva, The OTS Field Station on the Rio Porto Viejo just E of its junction with the Rio Sarapiquí. Near Holdridge Trail swamp. 1800 S x 2100 E m grid, 100-20 Aug 1980 *Hammel 9544* (MO, US); **GUANACASTE:** Tilarán, Quebrada Serena, southeast of Tilarán, 700-27 Jan 1926 *Standley & Valerio 46204* (US) **PUNTARENAS:** Between Golfo Dulce and Rio Térraba, 30-Nov 1947 *Skutch 5258* (US), Golfito, Parque

Nacional Corcavado, Península de Osa. Estación Agujas, Sendero Quebrada Bonanza, 8º32' N, 83º26' W, 300-500 10 Nov 1999 *Mora 703* (MO); **PORTO VIEJO:** La Selva, 90-1 Oct 1961 *Frankie 5a* (MO) **SAN JOSÉ:** Puriscal, Z.P. La Cangreja. Cuenca del Tulín. Colecta sobre sendero principal despues de la Quebrada Grande, 9º41'50" N, 84º22'55" W, 300-400 19 Sep 2000 *Acosta 2645* (MO) **CERTAGO:** Tirrialba, Parque Nacional Barbilla, Cuenca del Matina. Sector Quebrada San Miguel. Sendero Rio Barbilla arriba, camino a cerro Tigre, 9º58'20" N, 83º27'10" W, 300-400 16 Feb 2001 *Mora 1812* (MO). **PANAMA**. Colón: Forested hills near Rio Boquerón, 150-4 Sep 1977 *Maas et al. 2846* (MO, US); Area surrounding Rancho Chorro, mountains above Torti Arriba. Canzas mountais chain, 400-700 3 Dec 1977 *Folsom et al. 6651* (MO)**;** Darién: Tacarcuna, Trail from Tacarcuna Village on Rio Tacarcuna to Cierro Mali, 8º11' N, 77º17' W, 800-1300 16 Jan 1975 *Gentry & Mori 13611* (MO), Pucuro, Parque Nacional del Darién, Along Rio Pucuro, ca. 18 km E of Pucuro; to site of old Kuna Village of Tacarcuna, 8º04' N, 77º16' W, 500-600 18 Oct 1987 *Nevers et al. 8385* (MO); Veraguas: Valley of Rio dos Bocas, 11 km from Escuela Agricola Alto Piedra (above Santa Fe) on road to Calovebora, 450-30 Aug 1974 *Croat 27505* (MO); Barro Colorado: Wheelwe Trail 1500, 26 Aug 1970 *Croat 11900* (MO).

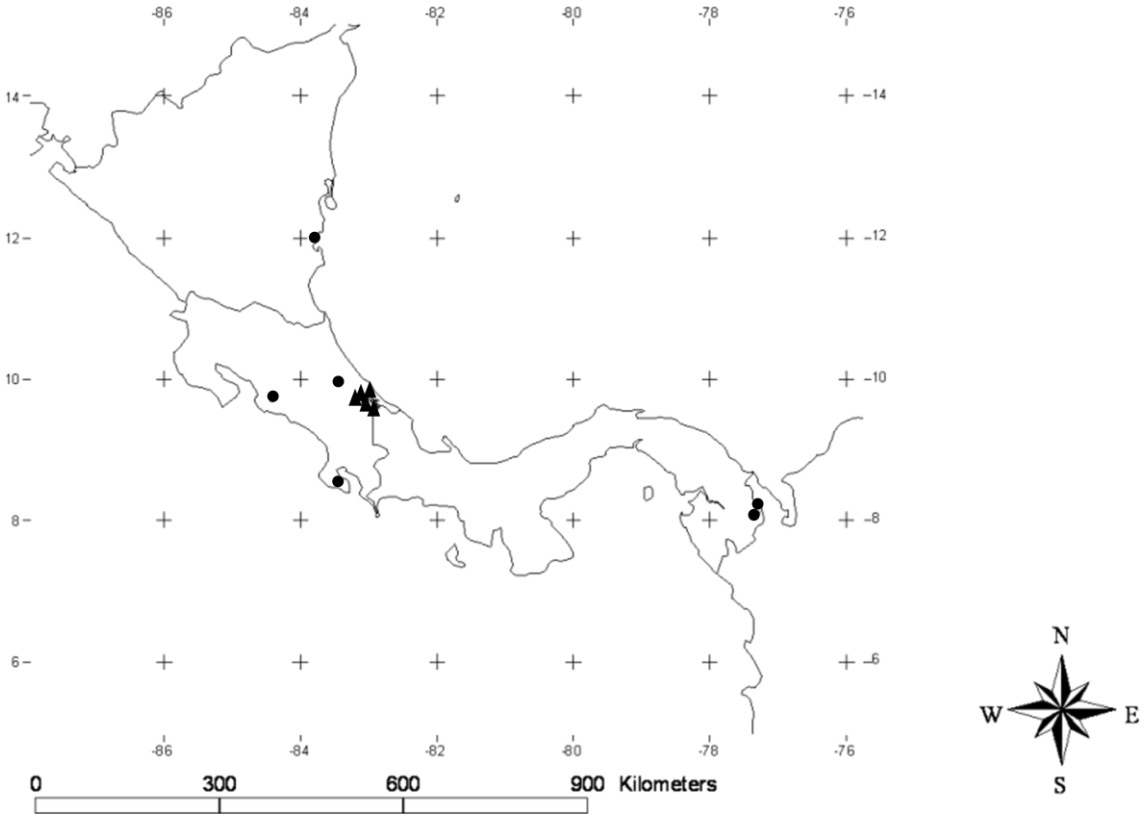

Fig. 14 – Distribution of *Herpetacanthus panamensis* (●) and *H. stenophyllus*(▲).

Herpetacanthus parvispica Indriunas & Kameyama, Syst. Bot. 20XX. Type: Brazil. Rio de Janeiro: Volta Redonda, Floresta da Cicuta, 18 Apr 1990, *J. P. P. Carauta, M. F. Frigoletto, D. S. Pedrosa, D. F. Lima, Bosisio, D. O. Sodré & L. C. B. Côrtes 6009* (holotype: GUA).

Branched subshurub, stems terete, glabrescent, sparsely pubescent at the apex, anisophyllous. Leaves elliptic to ovate, apex mostly acute, obtuse or slightly acuminate, base acute, decurrent, the largest leaves of each node with petiole (0.4–)1–1.5 cm long, blade 4.6–5 × 1.5–2 cm, smallest leaves with petiole 0.2–0.5(–1.2) cm long, blade 2.7–5.2 × 1.5–2 cm, sparsely pilose and ciliate at the base . Inflorescence of one terminal and 2 axillary reduced spikes (or tyrsus) on the distal nodes and lower nodes, ca. 2 cm long, peduncle (3–)510(–17) mm long, bracts short petiolate, widely elliptic to ovate, apex acute or obtuse, sometimes slightly cuspidate, base obtuse to rounded, sometimes subcordate, often oblique, 0.8–1.7 × 0.6–1.3 cm, glabrate, sparsely ciliate. Bracteoles lanceolate, 1–1.5 × 0.25 mm, sparsely pilose, ciliate. Calyx segments lanceolate, 2–4 mm, glabrescent, ciliate. Corolla white, 15–25 mm, tube 8–10 mm, throat ca. 7 mm, lower lip with lateral lobes ca. 5× 2.5 mm, central lobe 5 × 4 mm, upper lip 7 × 5 mm, puberolous. Anterior stamens ca. 5 mm long; posterior stamens ca. 2.5 mm; filaments almost completely glabrous. Ovary glabrous. Style ca. 15 mm, hirsute at the base. Capsule not seen.

Distribution and Ecology —. Known only from the type material collected in a remnant of the Atlantic Forest in southern Rio de Janeiro State. (Fig. 15)
Phenology — Flowering in April.

Herpetacanthus parvispica and *H. pauciflorus* are distinct from all other *Herpetacanthus* on the relatively long pedunculate and much reduced spikes or thyrsus with one to four flowers. *H. parvispica* differs from *H. pauciflorus* for the leaves with petiole 1 – 1.5 cm, blade 2.7–5.2 × 1.5–2 cm, bracts widely elliptic to ovate, 0.8–1.7 × 0.6–1.3 cm, glabrate, sparsely ciliate, and *H. pauciflorus* has shorter petiole 0.3–0.7cm, larger blade 6–11.5 × 2.5–4.5 cm, bracts ovate, 1.8–2.3 × 1.2–1.7 cm, glabrous.

Herpetacanthus pauciflorus Indriunas & Kameyama, Syst. Bot. 20XX. – Type: Brazil. São Paulo, São Vicente, Parque Estadual Xixová-Japuí, 23º58’37” – 24º02’06” lat. S e 46º22’19” – 46º24’42” long. W, trilha da pedreira, segundo acesso sentido costeira, margem do caminho para o Morro do Japuí, 1 Feb 2002, *J. A. Pastore & C. Moura 1103* (holotype: SPSF).

Erect to branched subshurub 25–50 cm, stems terete, glabrescent, sparsely pubescent at the apex, slightly anisophyllous. Leaves elliptic, apex mostly acuminate, base acute, petiole 0.3–0.7cm, blade 6–11.5 × 2.5–4.5 cm, petiole sometimes puberulous, blade glabrous. Inflorescence of very reduced terminal and one axilary spikes or cymes on distal nodes, 2.5–4.5 cm long, peduncle 12.6 cm long, bracts short petiolate, ca. 1 mm, ovate, apex acute or obtuse, sometimes acuminate, base rounded to subcordate, 1.8–2.3 × 1.2–1.7 cm, petiole inconspicuously ciliate, glabrous. Bracteoles lanceolate, 2–4 × 0.5 mm, sparsely ciliate. Calyx segments lanceolate, 2–3.5× 0.5 mm, glabrescent, sparsely ciliate. Corolla white, inferior lobes yellowish, ca.20 mm, tube 6 mm, throat ca.6 mm, lower lip with lateral lobes ca. 5× 3 mm, central lobe 5 × 5 mm, upper lip 6 × 3.5 mm, puberulous. Anterior stamens ca. 5 mm long; posterior stamens ca. 2.5 mm; filaments almost completely glabrous. Ovary glabrous. Style ca. 15 mm, glabrous. Capsule ca. 1.3 cm, glabrous. Seeds ca. 3 × 2 cm.

Distribution and Ecology —. *H. pauciflorus* is known from two collections from two different areas about 80 km from each other, on the slopes of Serra do Mar, close to the sea on São Paulo coast. It grows in the understory.
Phenology —. Flowering in December and February, fruiting in December.

Selected specimens examined. BRAZIL. **SÃO PAULO:** São Sebastião, Monte Forje, 23º45'16" S, 45º39'13" W, 18 Dec 1998, *Souza et al. 21671* (ESA).

Similar to *H. parvispica* (See notes on *H. parvispica).*

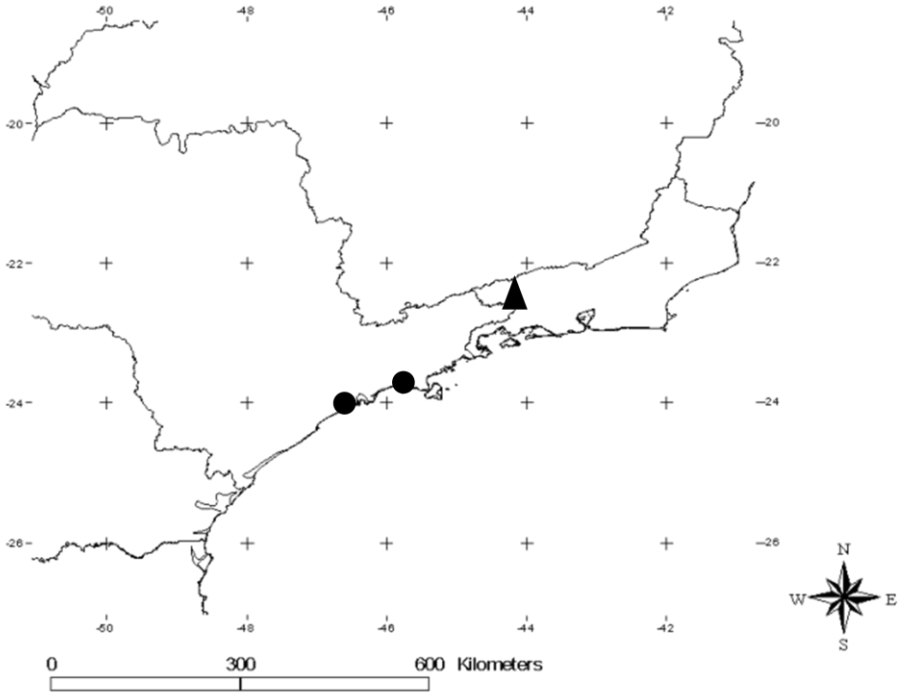

Fig. 15 – Distribution of *Herpetacanthus parvispica* (▲) and *H. pauciflorus* (●).

Herpetacanthus rotundatus (Lindau) Bremek. Rec. Trav. Bot. Neerl. 35. 164. 1938. *Juruasia rotundata* Lindau Bull. Herb. Boissier ser. 2, 4: 403. 1904. Type: Brazil. Amazonas. Rio Juruá, Juruá Miry, Jun 1901, *E. H. G. Ule 5573* (holotype B, destroyed; lectotype, here designated: MG; isolectotype: F [photo], G [photo], K [photo]).

Local name – Shancorotiche (Peru, Cuzco, Convencion, Quempiri)

Subshrub 0.3–1(–1.3) m; stems terete to subterete, slightly anisophyllous, sparsely glabrate. Leaves petiolate, blade ovate to elliptic, sometimes oblong, apex acute to acuminate, base often acute, sometimes decurrent, petiole 0.3–1(–1.5) cm long, blade (2–)4–12 × (1.5–)2–4 cm, glabrate. Inflorescence a terminal and two axilary spikes on the distal node, sometimes also on lower nodes; 1–5 cm long, peduncle ca. 0.5 cm long, glabrate. Bracts mostly green or yellowish to purpliwish, elliptic to widely elliptic, apex round to obtuse, often slightly acuminate, base often obtuse to round, oblique, 9–12 ×

8–9.5 mm, glabrate, sparsely ciliate. Bracteoles often linear-lanceolate, sometimes lanceolate, 3–9 × 0.5–1 mm, glabrous, inconspicuously ciliate. Calyx segments lanceolate, 3–5× 0.5 mm, often glabrous, sometimes glabrate, minutely sparsely ciliate to the apex. Corolla white to purplish, often with purple or brownish macula on the throat, ca. 15 mm, tube ca. 8 mm, throat ca. 4 mm, lower lip with lateral lobes, 2 × 1 mm, central lobe ca. 2.5 × 3 mm, upper lip ca. 4 × 3 mm. Longer stamens ca. 4 mm long; shorter stamens ca. 2 mm; filaments sparsely glandular-pilose. Ovary sparsely glabrate at the apex. Style ca. 12 mm, sparsely glabrate at the base. Capsule ca. 1 cm, glabrous. Seeds 2 × 1.5 mm. (Fig. 12 C-D)

Distribution and Ecology — In the Amazon region in Colombia, Ecuador, Peru, Brazil, and Bolivia. It grows in inundate and noninundate (terra firme) well preserved or disturbed forest, from 100 to 600 m elevation. (Fig. 5)
Phenology – Flowering from March to October, fruiting from June to December.

Selected specimens examined. COLOMBIA. **AMAZONAS:** Río Caqueta TRA 25, 250 al lado norte (mar. izquierda), frente a la isla de las Palmas, *Palacios et al. 1392* (US).
ECUADOR. **PICHINCHA:** Colorado, In the Colorado community "Congoma Grande" at km. 23 on the Santa Domingo - Puerto Limón road, 0º21' S, 79º22' W, 100-10 Jun 1982 *Kvist & Holm-Nielsen 40211* (US); **NAPO:** Rio Wai si ayá. 1.5-2 km upriver from the outlet in Rio Aguarico, 0º15' S, 76º21' W, 300-14 Aug 1981 *Brandyge et al. 33533* (US); **MORONA SANTIAGO:** Taisha, Tashia, El Centro Shuar Kankaim, (Cangaimine), Rio Kankaim (Cangaime). 20 km WNW del Taisha, 2º20' S, 77º41' W, 500-15 Oct 1985 *Shiki RBAE190* (NY, US)
PERU. **SAN MARTIN:** Mariscal Caceres, Tocache Nuevo, Camino a Shunté, 9 Mar 1970 *Schunke 3850* (INPA, US), Mariscal Caceres, Tocache Nuevo, Quebrada de Huaquisha (margen derecha del rio Huallaga), 4 Jun 1970 *Schunke 4029* (US), id.,400-450 3 Jul 1974 *Schunke 7148* (US); **UCAYALI:** Purus, Purus, Rio Curanja, cerca la comunidad nativa de Columbiana, 10º04' S, 71º06' W, 325-18 Jul 1998 *Graham 620* (NY); **MADRE DE DIOS:** Reserva de Tambopata, Ants trail and swamp trail, 1 Jun 1986 *Funk et al. 8357* (NY, US), Tahuamanu, Camino a San Francisco a 2 km de Noaya, km 41 de carretera Iberia-Iñapari, 29 May 1978 *Encarnación 1162* (NY, US), Tambopata, Tambopata Nature Reserve, 30 air km or 70-80 river km SSW Puerto Maldonado at effluence Rio La Torre 9 (Rio D'Orbiny)/ Rio Tambopata (SE bank), 12º49' S, 69º17'

W, 260-3 May 1980 *Barbour 5110* (US), 30 air km or 70-80 river km SSW Puerto Maldonado at effluence Rio La Torre 9 (Rio D'Orbiny)/ Rio Tambopata (SE bank), 12º49' S, 69º17' W, 260-4 Jun 1980 *Barbour 5500* (US); **CUZCO:** Convencion, Quempiri, caserío campa, margem derecha del rio Ene, 460-480 24 Jul 1965 *Ferreyra 16383* (US); **LORETO:** Maynas, Yanamono Explorama Tourist Camp, 25 km del NE de Iquitos, a lo largo del rio Amazonas; trocha perimentral al sur (límite) Yanamono, 3º30' S, 72º50' W, 110-7 Sep 1990 *Pipoly et al. 12513* (US), Santa Rosa, lower Rio Huallaga below Yurimaguas, 135-1 Sep 1929 *Killip & Smith 28944* (US), Iquitos, 100-3 Jul 1929 *Killip & Smith 27470* (US); **HUÁNUCO:** Pachitea, Honoria, Bosque Nacional de Iparia: Región de "bosque seco tropical" (sensu Tosi, 1960) a lo largo del Río Pachitea cerca del campamento Miel de Abeja (1 km. arriba del pueblo de Tournavista o unos 20 km. arriba de la confluencia con el Río Ucayali), 300-400 3 May 1967 *Schunke 1910* (US); **LA MERCED:** 610-10 Jul 1923 *MacBride 5324* (US)

BRASIL. **ACRE:** Cruzeiro do Sul, Rio Juruá, Igarapé Treze de Maio, 12 May 1971 *Maas et al. P12874* (INPA), Marechal Thaumaturgo, Basin of Rio Juruá, Rio Bagé (tributary of Tejo), inland from right bank, 8º56'01" S, 72º33'54" W, 1 May 2001 *Daly et al. 10800* (NY), Tarauacá, Rio Muru, 6 km above confluence with Rio Tarauacá, 16 Sep 1968 *Prance et al. 7291* (INPA, NY, US), Rio Branco, Mata do Fomento, 29 August 1960 *Emygdio 1835* (R), Km 11 on Rio Branco Quixada road, 18 Oct 1980 *Lowrie et al. 581* (INPA, US).

BOLIVIA. **SANTA CRUZ:** Ichilo, 6 km SW of Vill San Germán, south side of Rio Moile, opposite Campamento Moile of Parque Nacional Amboró, 17º24' S, 64º08' W, 275-20 Nov 2000 *Nee 51549* (NY); **BENI:** Ballivian y Yacuma, Estacion Biologica del Beni, Charaton, orilla chaco Julio Lero, 14º30' S, 66º37' W, 200-28 May 1995 *Guareco 488* (US), Fundo Curareland near Tinanta, 20 km NW of Tocache at N edge of palm plantation, mature forest and edge on alluvial soil near Río Huallaga, 500-14 Mar 1979 *Gentry et al. 25713* (US).

Herpetacanthus rotundatus is similar to *H. acuminatus*, for differences see *H. acuminatus*. The holotype designated by Lindau (1904) was destroyed, therefore we designated a lectotype from Herbarium MG.

Herpetacanthus rubiginosus Nees in Mart. Fl. Bras. 9: 94. 1847. Type: Brazil. Rio de Janeiro: Schott (lectotype, here designated: W [photo]).
Herpetacanthus macahensis Nees in Mart., Fl. Bras. 9: 95. 1847. Type: Brazil. Rio de Janeiro: "in sylvis Macahé", Jun 1832, Langsdorff (lectotype, here designated: GZU [photo]).

Small subshrub that seems herbaceous, creping or decumbent, 5–30 cm, commonly species develop adventitious roots at the nodes which touch the substrate, stems glabrescent, often young ones with 2 or 4 notorious longitudinal lines with reflexed eglandular trichomes, whitish to brownish trichomes to 1 mm, slightly anisophyllous. Leaves mostly elliptic to oblong or sometimes lanceolate to ovate, apex obtuse to acute, base often acute, sometimes obtuse, rarely slighter oblique, discolor, sometimes variegated, petiole (0.2–)0.3–1.0(1.7) cm long, blade (1.7–)2.5–9.2(–10)×0.9–4.9(5.2) cm, petiole and blade glabrate to densely pilose, especially on the base, often ciliate. A terminal and sometimes one axilary spikes on the distal node, 0.5–6 cm long, peduncle ca. 0.5 cm long, pubescent, axis glabrescent. Bracts sessil to subsessil, mostly obovate to oblanceolate, sometimes ovate, lanceolate or elliptic, apex often obtuse, sometimes abruptly cuspidate, base acute, green or vinaceous, ca. 9–13 × 5(–8) mm, glabrescent, sometimes with long distinct pluricelular trichomes especially on the veins, ca. 1 mm, mostly long ciliate with same kind of trichomes. Bracteoles mostly lanceolate, sometimes obovate to oblanceolate, ca. 0.5 × 2.5 mm, glabrate to glabrescent, usually ciliate with long distinct pluricelular trichomes. Calyx segments lanceolate ca. 2 mm, glabrate. Corolla white to purpulish, often with vinaceous or purple macula on the throat, ca. 17 mm, tube 5 mm, throat 5 mm, lower lip with lateral lobes 5 × 3 mm, central lobe 4 × 4 mm, upper lip 5 × 4 mm. Longer stamens 4 mm long,; shorter stamens 2 mm; filaments sparsely pilose with glandular trichomes. Ovary glabrous. Style 10 mm, glabrous. Capsule ca. 1 cm, glabrous. Seeds 2 × 2.5 mm. (Fig 9D, 13 E-k)

Distribution and ecology— Southeastern Brazil in wet forest, usually close to water course, forming large populations; on clay to sandy soils, from 10 to 600 m. (Fig. 8)
Phenology – flowering and fruiting from August to December.

Selected specimens examined. BRAZIL. **MINAS GERAIS:** Descoberto, Reserva Biológica da Represa do Grama, 21º27'35" S, 42º58'02" W, 31 Oct 2001, *Castro et al.*

652 (MBM, RB, SPF); **ESPÍRITO SANTO:** Cachoeira do Itapemirim, Vargem Alta, 21º00'40" S, 40º50'02" W, 650 m, 3 Jun 1949, *Brade 19967* (RB); **RIO DE JANEIRO:** Guapimirim, Serra dos Órgãos, Barreira, 26 Oct 1949, *Pereira 628*; (RB); Paraty, Área de Proteção Ambiental Cairuçu, Laranjeiras, Cachoeira das Pedras, caminho para Praia do Sono, 23º02' S, 44º30' W, 8 Dec 1993, *Marquete 1376* (RB, SP), trilha para a Praia do Sono, acesso a esquerda, 23º19'45" S, 44º39'13" W, 133 m, 17 Nov 2010 *Indriunas et al. 54* (SP), trilha para a Praia do Sono, 29º19'53" S, 44º38'56" W, 54 m, 17 Nov 2010 *Indriunas et al. 55* (RB, SP), Morro entre Laranjeiras e Sono, 20 Oct 1978, *Araujo et al. 2251* (GUA), Condomínio Laranjeiras, estrada para a praia do Sono, 23º02'39" S, 44º39'25" W, 15 Nov 1993, *Sanchez et al. 29938* (UEC), Estrada nova para a Praia do Sonho, 15 Nov 1993 *Barros 2868* (SP), Fazenda São Roque, Lote Sr. Liberato (área de implantação de reforma agrária - EMATER - RIO), 23º13'04" S, 44º42'46" W, 20 Oct 1988, *Vaz 586*; (HRB, RB), beira da estrada para fazenda Sta Maria, 19 Oct 1978, *Araujo et al. 2238* (GUA); **SÃO PAULO:** Bertioga, Rod. BR 101, Km 203. Condomínio Guaratuba 2, depois do Morro da Petrobrás, 23º51'17" S, 46º08'18" W, 22 Aug 1995, *Proença et al. 81* (SP), Riviera de São Lourenço, 23º47'28" S, 46º01'28" W, 20 Oct 1999, *Martins 568* (SP), rod.SP-55, km 211,5, fazenda da Família Pinto, 2 Sep 1999, *Sampaio et al. 344* (SP) ;Caraguatatuba, Parque Estadual da Serra do Mar, Núcleo Caraguatatuba, Trilha do Jequitibá, 27 Sep 2000, *Cordeiro et al. 2332* (NY, SP, SPSF), id., 23º35'27" S, 45º25'44" W, 72 m, 19 Nov 2010 *Indriunas et al. 66* (SP), id., 23º35'32" S, 45º25'44" W, 72 m. 20 Nov 2010, *Indriunas et al. 72* (SP), Trilha do Poção, 23º35'27" S, 45º25'18" W, 55 m, 20 Nov 2010, *Indriunas et al. 69* (SP); Mauá, Projeto Rodoanel, trecho sul, lote 1, 28 Nov 2007, *Shirasuna et al. 708* (SP); Piassaguera, 23 Oct 1923 *Hoehne s.n.* (SP); Santos, Área da Santa Casa de Misericórdia de Santos. Trilha 3, 23º57' S, 46º20' W, 3 Oct 2007, *Garcia et al. 3139* (SP); Ubatuba, Parque Estadual da Serra do Mar, Núcleo Picinguaba, Trilha para a Rasa do Catarino, 9 Dec 1989, *Furlan et al. 1063* (SP), trilha do Corisco. Mata secundária nas proximidades da "Casa da Farinha", a ca. 9-10 km da fronteira com o Município de Parati (RJ), 23º26'03" S, 45º04'15" W, 10-15m, 13 Nov 1990, *Giordano et al 894.* (RB, SP), id.,23º20'48" S, 44º50'59" W, 9 Nov 1993, *Sanchez et al. 29921* (SP, UEC), id., 23º26'03" S, 45º04'15" W, 11 Nov 1990 *Furlan et al. 1301* (SP, UEC), id. 23º22'37" S, 44º50'16" W, 2 Dec 1993, *Rossi et al.1371* (SP), id., 23º21'25" S, 44º50'48" W, 9 Nov 1993, *Martins et al. 29208* (UEC), id., 23º21'95" S, 44º51'10" W, 999 m, 25 Aug 2007, *Nunes et al. 1834* (HUEFS), id., 23º20'06" S, 44º49'87" W, 304 m, 24 Aug 2007,

Miranda et al. 1013 (HUEFS), id, desvio a direita, acesso a cachoeira, 23º20'18" S, 44º50'13" W, 26 m ,18 Nov 2010, *Indriunas et al. 58* (SP**,** SPF), id., 23º20'12" S, 44º50'04" W, 57m, 18 Nov 2010, *Indriunas et al. 60* (SP**,** SPF), Trilha do Palmital (atrás do alojamento), 12 Nov 1990, *Furlan et al. 1324* (FUEL), id., 23º26'03" S, 44º51' W, 7 Oct 1988, *Cunha et al. 86* (MBM, SP), Morro Corcovado, 8 Sep 1998, *Ribas et al. 2719* (MBM), Estação Experimental do Instituto Agronômico, 23º25'12" S, 45º07'39" W, 12 Nov 1993, *Santin et al. 29914* (SP, UEC), Pontal da Lagoinha, km 237 da Rodovia São Paulo-Ubatuba, 50 m, 13 Jul 1980, *Forero 7671* (SP), Praia de Maranduba, 23º25'50" S, 45º04'10" W, 16 Nov 1993, *Martins, et al. 29408* (UEC).

Herpetacanthus rubiginosus is a decumbent, almost herbaceous, subshrub, the two, rarely four, lines of long trichomes on young stems are, usually, very conspicuous, bracts indument are often dense with long pluricelular trichomes, it is very variable in leave size and color, varying from entirely nacreous pale green or variegate.

In describing *Herpetacanthus rubiginosus* Nees (1847a) cited three syntypes, a Sellow collection in Herbarium B was destroyed, we choose collection from Schott in herbarium W which is in good conditions and is a representative material.

The holotype of *Herpetacanthus macahensis* in Herbarium LE was not found, according the curator, Mr. Tatanov (pers. comun,), so we select the duplicate from Herbarium GZU as a lectotype.

In describing *H. macahensis* Nees (1847a) pointed out three differences between *H. rubiginosus* and *H. macahensis*: size and shape of leaves; looser inflorescence in *H. macahensis* and size and insertion of the bracts. The types from both species show more similarity than differences, and the analysis of herbarium material and field observation show that size and shape of leaves and bracts varies considerably within the population and in same individuals; the development of the inflorescence is continuous during the flowering and older inflorescences are looser, bracts can be sessile or subsessile in the same individual. In our concern, *H. rubiginosus* and *H. macahensis* are conspecific.

Herpetacanthus stenophyllus Gómes-L. & Grayum Novon 1(1): 15. 1991. Type: Costa Rica. Limón: Reserva Biológica Hitoy-Cerere, seguiendo El Sendero Espavel hasta La fila, Cordilheira de Talamanca, 9º39'15"N, 83º01'20"W. 695m, *G. Herrera & A. Chacón 2404* (holotypo, CR [photo]; isotypes, F [photo], MO, USJ n.v.).

Branching subshrub 0.5–1.5 m; stems slender, greenish, terete, glabrescent, slightly anisophylous. Leaves with petiole (0.3–)–0.5–1.2(–1.5) cm long, glabrescent, blade linear-laceolate, apex acute to slightly obtuse, base acute, attenuate, oblique, 7–12 × (0.3–) –0.5–1.0(–1.7) cm, glabrous, sparsely ciliate at the base, with eglandular and glandular trichomes, 9–12 pairs of secondary veins. Inflorescence one terminal spike and sometimes one axilary on the distal node, 2–7 flowers, 1.7–4 cm long, peduncle 2.5– 6(–8) cm long, glabrate, rachis glabrate. Bracts pale green, membranous, sessile to subsessile, ovate, 1–2 × 0.5–0.8 cm, the sterile ones usually smaller, apex acute to slightly acuminate, base obtuse to rounded, rare sterile ones subcordate, oblique, glabrous, sparsely ciliate. Bracteoles linear to linear-lanceolate, ca. 8 × 1 mm, ciliate. Calyx segments linear-lanceolate, glabrous, 5–8 × 0.5 mm. Corola whitish, pilose, ca. 16 mm, tube 6 mm, throat 3 mm, 4.5 × 4 mm, lower lips with central lobe 2.5 – 2 mm, lateral ones 2.5 – 1 mm. Anterior stamens ca. 4 mm long; posterior stamens ca. 2 mm; filaments sparsely glandular-pilose. Ovary glabrous. Style ca. 14 mm, glandular-pilose. Capsule ca. 1 cm, glabrous. Seeds ca. 2x2 mm. (Fig. 3C)

Distribution and Ecology – H. stenophyllus is endemic from the mountains between the Valle de La Estrella and Valle de Talamanca in Costa Rica. According Gómes-L. & Grayum (1991), it seems to be locally abundant, it grows in slightly disturbed areas in primary forests, from 40 to 700 m elevation. (Fig. 14)
Phenology – Collected with flowers from January to March and from July to August, and with fruits from February and March.

Selected specimens examined. COSTA RICA. **LIMÓN:** Bribrí, Cantón de Talamanca, Aprox. 6 km al oeste del pueblo en un parche de bosque ramanente a lo largo de una pequeña cordillera, 9º37'40" N, 82º51' W, 40 m, 23 Jan 1991, *Zamorra et al. 1574* (MO), Cantón del Limón, Cuenca del Estrella, Penhurst. Finca Jupiter, 9º43'52" N, 82º55'56" W, 200 m, 18 Jan 1997, *Rodriguez 1916* (MO), Miramar, Valle de las Rosas, Cordillera de Talamanca. Afluentes de Rio Moin, margem izquierda, 9º38'20" N,

83º00'30" W, 350 m, 12 Feb 1989 *Herrera et al. 2390* (MO), Reserva Biológica Hitoy Cerere, Valle de la Estrella. Sendero el Níspero camino a Cerro Bobócara, 9º40'50" N, 83º04'20" W, 700 m, 2 Mar 1990, *Herrera 3855* (MO), Trail from Rio Cerere to Cerro Bobócara, 9º39' N, 83º00' W, 100-500 m, 26 Feb 1991 *Daniel et al. 6227* (MO), Hitoy Cerere Reseve and vicinity in Valle La Estrella S of Finca Concepcion; from station to top of ridge Miramaror Los Jabillos, 9º42' N, 83º02' W, 140-500 m, 1 Aug 1985 *Hammel 14312* (MO), SW of Valle La Estrella. Along Rio Cerere to ca. 1 km upstream from Quebrada Barrera, 9º40'30" N, 83º02' W, 90-200 m, 31 Jul 1985 *Grayum et al. 5778* (MO), Talamanca, Reserva Indigena Bribri, Asentamiento Volio. Cuanca del Rio Uatsi, 9º37'30" N, 82º54' W, 100-300 m, 25 Nov 1998, *Valverde et al. 1147* (NY).

Herpetacanthus stenophyllus is unique in the genus by its long linear-lanceolate leaves. In the protologue, the authors overlooked the presence of glandular trichomes at margin of the blade, especially at the base.

Herpetacanthus strongyloides Indriunas & Kameyama, Syst. Bot. 20XX. Type: Brazil**.** Cidade de Ilhéus, 3 km north of Rodoviária, Mata da Esperança, forest north of dam and reservoir, 14º46'55" S, 39º04'09" W, 50m, 16 Sep. 1994, *W.W. Thomas, A.M. Carvalho, J. Jardim, L.M. Silva, S. Santana 10503* (holotype: US, isotype: MO).

Branched subshrub, 0.5–1.5 m; stems terete, mostly anisophyllous. Leaves elliptic to ovate, apex acute to acuminate, base acute to cuneate, long decurrent, often oblique, discolor, abaxial surface dark green, adaxial surface pale green, membranaceous, glabrescent, slightly ciliate, trichomes minute, the largest leaves of each node with petiole (0.6–)1–1.6(–2.7) cm long, blade (11.3–)12.5–20(–24) × (3–)4–6.7(–8.2) cm, the smallest ones with petiole (0.2–)0.5–1.2(–2.7) cm long, blade (2.7–)4.8–15.5(–20) × (0.6–)2–4(–7.6) cm, leaves subtending the main inflorescence similar to the other leaves or similar to the bracts, but smaller. Inflorescence a terminal and two axilary spikes on the distal node, sometimes also on lower nodes, 2.5–7.5 cm long, peduncle 0.3–0.6 cm long, glabrescent; rachis glabrescent; bracts rounded to widely elliptic, apex round, mostly briefly cuspidate, sometimes briefly retuse cuspidate, base obtuse, often slightly oblique, (7–)12–16 × (10–)14–18 mm, pale green, sometimes almost white basally,

white or purplish, membranaceous, pubescent to sparsely hispid, often along veins, ciliate. Bracteole linear-lanceolate, 4–6 × 0.5 mm, puberulent to puberulous, with glandular and eglandular trichomes, ciliate. Calyx segments lanceolate, ca. 5.5 × 0.5 mm, puberulent with glandular and eglandular trichomes, ciliate. Corolla white, sometimes with a purple macula on the throat, puberulous, ca. 18 mm, tube 7 mm, throat 4 mm wide, lower lip with lateral lobes 3 × 2.2 mm, central lobe 2.4×3.8 mm, upper lip 6 × 4.8 mm. Anterior stamens 4.5 mm long; posterior stamens 3.5 mm; filaments sparsely glabrescent. Ovary puberulent ca. 2.5×1.2 mm. Capsule not seen.

Distribution and Ecology — Species known only from one locality in Ilhéus, in the state of Bahia, growing in the understory of a relatively well preserved wet forest, nearby the urban area, close to a water reservoir. (Fig 11)
Phenology — Flowering in September and October.

Selected specimens examined. BRAZIL. BAHIA: Ilhéus, Mata da Esperança, Coletas efetuadas próximo à represa, 29 Oct. 1994, *Amorim 1658* (US).

Herpetacanthus strongyloides resembles *H. longiflorus*, but is distinct by the larger membranaceous rounded bracts, 12-16 x 14-18 mm, shorter corolla, ca. 1,8 cm long, with a rounded central lobe, in *H. longiflorus* bracts are smaller, cartaceous, ovate to elliptic, ca. 14 x 7 mm. and the corolla is ca. 3 cm long, with lanceolate central lobe.

Herpetacanthus tetrandrus (Nees & Mart.) Herter, Revista Sudamer. Bot. 7:230. 1943. *Dicliptera tetrandra* Nees & Mart. Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 11(1): 61. 1823. Type: Brazil. Bahia: "Ad viam Felisbertiam Ianuario mense 1817", *M. A. P. Wied-Neuwied* (lectotype, here designated: BR sheet 694497 [photo], isolectotype: BR sheet 694512 [photo], BR sheet 694479 [photo], GZU [photo]).
Herpetacanthus schultzii Nees in Mart., Fl. bras. 9: 96. 1847. Tab. 12. nom. nov. for *Dicliptera tetrandra* Nees & Mart.

Subshrub, 0.2–0.5 m tall; stems terete to subterete, hirsute to pubescent, with ferruginous trichomes, slightly anisophylous. Leaves blade widely elliptic to ovate, sometimes oblong, apex acute to slightly acuminate, base obtuse, decurrent, petiole (0.7–)1–4 cm long, blade 12–19.5 × 4.5–8 cm, petiole and blade base often tomentose, the abaxial surface generally strigose, adaxial pubescent, with trichomes on midrib. Inflorescence a terminal and one axilary spikes on the distal node, rarely with 2nd order branching; 3.5–13.5 cm long, peduncle 0.5–1.5 cm long, hirsute with ferruginous trichomes. Bracts obovate to rounded, apex cuspidate or retuse cuspidate, base obtuse or rounded, mostly pale green, ca. 25 × 20 mm, sparsely pilose, mostly hirsute on the midribs, ciliate with trichomes of different sizes. Bracteoles linear-lanceolate, ca. 10 × 0.5 mm, puberolous, with glandular and eglandular trichomes, ciliate. Calyx segments ca. 5 × 0.25 mm, puberolous, with glandular and eglandular trichomes, ciliate. Matures corolla not seen, buds tomentose. Capsule ca. 2.2 cm, pubescent. Seeds 2.5 × 2 mm.

Distribution and Ecology – Herpetacanthus tetrandrus seems to be endemic to the surrounds of Porto Seguro in southern Bahia. It grows in wet forests. (Fig. 10)
Phenology – Flowering from January to June, collected with fruits from November to February.

Selected specimens examined. BRAZIL. **BAHIA:** Itamaraju, 20 km da cidade, 17º09'32" S, 39º23'37" W, 90-17 June 2005 *Stapf et al. 450* (HUEFS); Porto Seguro, Reserva Biológica do Pau-Brasil, 11 December 1971 *Eupunino 72* (US), id., Reserva Biológica do Pau Brasil (CEPLAC) 17 km. W. from Porto Seguro on road to Eunápolis, 16º24' S, 39º11' W, 20 20 January 1977 *Harley et al. 18134*; (MBM, NY, RB, UEC, US), 17 km W from Porto Seguro on the road to Eunápolis, 16º25' S, 39º12' W, 20 12 February 1974 *Harley et al* (US); Santa Cruz de Cabrália, Cerca de 16 km a W de Porto Seguro. Leito do rio temporário, atrás do pomar, 16º16'60" S, 39º01'59" W, 4 March 1983 *Brito et al.185* (UEC); 16 km W of Porto Seguro, 25 November 1987 *Maas et al. 7012* (US); Uruçuca, Estrada que liga Uruçuca/Serra Grande, a 28-30 km ao NE de Uruçuca, 26 June 1979 *Mori 12048* (US).

It is distinguishable by the scabrous abaxial leave surfaces and bracteoles with dense glandular trichomes.

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CONSIDERAÇÕES FINAIS

O presente trabalho consta da revisão taxonômica do gênero *Herpetacanthus* Nees, realizada através da revisão da literatura pertinente, análise dos tipos nomenclaturais e, de material proveniente de herbários nacionais e internacionais, bem como oriundo de coletas. Como resultados relevantes há a melhor compreensão da morfologia das espécies e do gênero em si, o incremento substancial do número de espécies e o aclaramento de questões nomenclaturais.

Em relação às etapas de execução do projeto original, a revisão da literatura não apresentou maiores dificuldades, pois muita das bibliografias, incluindo os protólogos e floras, se encontram no acervo pessoal da Dra. Cintia Kameyama, na biblioteca do Instituto de Botânica, e mesmo disponíveis *on line*. Porém cabe ressaltar a dificuldade na obtenção da obra de Herter (1942) onde o autor fez a combinação de *Herpetacanthus tetrandrus* (Nees & Mart.) Herter; esta não está disponível em qualquer biblioteca nacional, tão pouco na biblioteca do New York Botanical Garden. Seu conteúdo só pode ser verificado graças à intervenção da Dra. Daniela Cristina Zappi, do Royal Botanic Gardens, Kew, Inglaterra, com o envio de uma cópia.

A obtenção e análise das cerca de 450 exsicatas oriundas de empréstimos de herbários apontaram para algumas questões problemáticas para a execução do trabalho que devem ser frisadas.

Foram visitados 24 herbários nacionais, destes dois não enviaram os materiais separados para estudo, os Herbários HRCB e CEPEC, este último, muito embora tenha sido consultado em janeiro de 2010, por motivos alheios aos meus empenhos, até o presente momento não enviou os empréstimos, o qual conta com importantes duplicatas de espécimes obtidas de outras instituições e, principalmente, com pelo menos, dois

tipos de espécies novas por nós descritas, que em muito contribuiriam para o estudo destes táxons.

A presença de estudiosos da família nas instituições, ou seu contato direto com estas, obviamente fomenta a qualidade e mesmo a quantidade do material de empréstimo destinado a estudos. Isto pode ser observado pelo material selecionado pelo Dr. Dieter C. Wasshausen, importante especialista em Acanthaceae e curador emérito do Herbário US, o qual, por seu intermédio, nos remeteu 79 exsicatas, com variada e importante amostragem de espécies e de locais de coleta, assim como o Dr. Tom F. Daniel, que consultou o acervo do Herbário CAS que triou o acervo e listou o material contido, evitando assim empréstimos desnecessários de poucas duplicatas.

Em contra partida, diversos herbários latino-americanos contatados, situados em regiões de ocorrência de espécies do gênero, atestaram não possuir exemplares de *Herpetacanthus* em seu acervo. Indubitavelmente, pode-se realmente não ter representantes do gênero nestas instituições, porém, como observado nas visitas aos herbários, a quase totalidade dos espécimes estava ou erroneamente alocada em gêneros diversos, como *Justicia*, *Dicliptera*, *Sanchezia* ou *Ruellia*, ou em Acanthaceae indeterminadas.

A indeterminação dos espécimes muitas vezes se dá também pela péssima qualidade do material herborizado, uma vez que a corola é rapidamente perdida após a coleta, sendo imprescindível a prensagem imediata dos exemplares. Incontáveis materiais analisados possuíam descrição da corola em seu rótulo, porém esta estava ausente, indicando possivelmente a sua perda durante esse processo. Em *Herpetacanthus*, como em outros gêneros com espécies secundifloras, a prática da colagem na montagem das exsicatas dificulta em muito o estudo detalhado das estruturas das inflorescências, pois muitas vezes além da abusiva quantidade de cola, as

brácteas e flores permanecem de tal forma aderidas à cartolina que o necessário manuseio pode levar a quebra destas. Por exemplo, a análise do isótipo de *Herpetacanthus stenophyllus* , enviado pelo Herbário NY, proveu informações sobre a espécie, mas a forma de confecção da exsicata limitou em muito a observação de maiores detalhes da inflorescência, sendo esta suprida por materiais adicionais e pela apreciação das imagens dos tipos digitalizados dos Herbário CR e F.

Essa nova tecnologia não substitui de modo algum a apreciação dos espécimes, propriamente ditos, porém, a meu ver, são de extrema utilidade viabilizando a visualização de estruturas e detalhes devido à alta qualidade da maioria das imagens digitalizadas. Durante a visitação ao Herbário MG, tive a oportunidade de analisar os tipos de *Herpetacanthus acuminatus* e *H. rotundatus*, porém suas imagens digitalizadas dos Herbários MG, F, K e G proveram sempre informações complementares.

A obtenção das imagens dos tipos nomenclaturais das espécies foi crucial para a melhor compreensão e delimitação das espécies, assim como para as tipificações realizadas. O único material tipo de *Herpetacanthus* não encontrado foi o de *H. longiflorus* var. *brachystachyus*, que segundo as indicações (Nees 1847b) deveria estar no Herbário LE, o qual foi contatado diversas vezes por e-mail e posteriormente por telefone com a ajuda de um interprete de língua russa. Porém a resposta foi negativa e o material encontra-se até o presente momento dado como perdido.

No que tange as questões nomenclaturais, além das lectotipificações e de uma neotipificação, o presente trabalho contribuiu para o esclarecimento da autoria do gênero e da data da obra em que fora originalmente publicada, antes controversa, porém agora melhor delimitada.

O estudo dos protólogos, dos tipos nomenclaturais, das limitadas descrições das espécies em poucas floras, aliado ao montante de exsicatas analisadas serviram de base

para o estudo, porém uma crucial fonte de informações foi obtida através das viagens de coletas.

Foram realizadas viagens a campo em Santa Tereza, ES, onde se pode observar e coletar espécimes de *Herpetacanthus macrophyllus*, seguida de uma incursão pela região sul do estado da Bahia: Ilhéus, Camacan e Serra Bonita, onde, porém não obstante as indicações fenológicas obtidas de material de herbário indicarem um período ideal para coleta, a atípica estiagem que ocorria no período não permitiu encontrar qualquer indivíduo fértil das espécies de ocorrência na região; posteriormente foram coletados e observados espécies de *H. chalarostachyus* sp. nov. na região da Juréia, SP, e, por fim, em quatro áreas de ocorrência de *H. rubiginosus* foram minuciosamente visitadas e coletadas, Santos, Ubatuba, Caraguatatuba (SP) e Paraty (RJ), além de duas outras viagens a campo em Mauá e Bertioga (SP), porém nestas não foram encontrados espécimes do gênero.

Várias questões surgiram indicando a necessidade de maiores estudos com o grupo, como por exemplo, análise de populações como as de *Herpetacanthus rubiginosus* que apresentam variações locais; a ontogenia da peculiar inflorescência e testar a filogenia do gênero e sua relação com os que compõem a linhagem *Pseuderanthemum*.

Algumas espécies de *Herpetacanthus* apresentam um potencial ornamental muito grande a ser explorado, como *H. longiflorus* e *H. neesianus* com suas brácteas e flores de cores intensas.

Por fim, este trabalho contribuiu para o melhor conhecimento deste agora não tão pequeno gênero e com prováveis subsídios para o melhor entendimento da própria família, além de apontar para a necessidade de trabalhos como este visando o maior conhecimento da flora brasileira.