

UMA NOVA ESPÉCIE LONGAMENTE CONHECIDA

Eliane Barbosa Rangel

**Montes Claros - MG
Maio - 2021**

Mestranda: Eliane Barbosa Rangel

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Dissertação apresentada à Universidade Estadual de Montes Claros como parte das exigências do Curso de Mestrado Acadêmico em Botânica Aplicada, área de concentração em Botânica Aplicada para a obtenção do título de Mestre.

Orientadora: Prof. Dra. Rúbia Santos Fonseca

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RESUMO

Uma nova espécie longamente conhecida

Resumo: Nova espécie de *Eugenia* do Cerrado Brasileiro é descrita e ilustrada por fotografias *in situ*. *Eugenia moda* é restrita à Formação Geomorfológica Urucuia, onde também ocorre *Eugenia dysenterica*, espécie de maior similaridade morfológica. É facilmente distinguida pela combinação dos seguintes caracteres: ritidoma com crista da fissura aguda, casca viva fibrosa, alborno amarelado, lâminas foliares geralmente com galhas oblongas, catáfilos da inflorescência maiores, com base amarelada e ápice ferrugíneo, glabros ou com margem ciliada esparsa, brácteas espatuladas e maiores, lobos calicinais com margem ciliada esparsa, bractéolas maiores, persistentes durante a antese e frutos alaranjados quando maduros. Além disso, o conhecimento etnobotânico suporta a segregação entre *Eugenia moda* (cagaita-da-moda) e *Eugenia dysenterica* (cagaita), contribuindo para corroborar nossos achados. São fornecidas notas sobre o habitat, distribuição, fenologia e estado de conservação de *Eugenia moda*, bem como, uma tabela comparativa e chave de identificação para separá-la das espécies mais semelhantes de *Eugenia* sect. *Pseudeugenia* do Cerrado.

Palavras-chave: Ameaçada de extinção, conhecimento tradicional, *Eugenia* sect. *Pseudeugenia*, Cerrado, taxonomia, veredeiros.

ABSTRACT

A new species long-known

Abstract: New species of *Eugenia* from the Brazilian Cerrado is described and illustrated by *in situ* photographs. *Eugenia moda* is restricted to the Urucua Geomorphological Formation, where *Eugenia dysenterica* also occurs, a species with greater morphological similarity. But it is easily distinguished by the combination of the following characters: rhytidome with acute fissure crest, fibrous living inner bark, yellowish sapwood, leaves blades usually with oblong galls, larger inflorescence cataphylls, yellowish at base and ferruginous at apex, glabrous or with a sparse ciliate margin, spatulated and larger bracts, calyx lobes with ciliate sparse margin, larger bracteoles, persistent during anthesis and orange fruits when ripe. In addition, ethnobotanical knowledge supports the segregation between *Eugenia moda* (cagaita-da-moda) and *Eugenia dysenterica* (cagaita), contributing to the certainty of our findings. Notes on the habitat, distribution, phenology and conservation status of *Eugenia moda* are provided, as well as an comparative table and identification key to separate it from the more similar Cerrado species of *Eugenia* sect. *Pseudeugenia*.

Keywords: Endangered, *Eugenia* sect. *Pseudeugenia*, Cerrado, taxonomy, traditional knowledge, veredeiros.

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Uma nova espécie longamente conhecida

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Abstract

New species of *Eugenia* from the Brazilian Cerrado is described and illustrated by *in situ* photographs. *Eugenia moda* is restricted to the Urucua Geomorphological Formation, where *Eugenia dysenterica* also occurs, a species with greater morphological similarity. But it is easily distinguished by the combination of the following characters: rhytidome with acute fissure crest, fibrous living inner bark, yellowish sapwood, leaves blades usually with oblong galls, larger inflorescence cataphylls, yellowish at base and ferruginous at apex, glabrous or with a sparse ciliate margin, spatulated and larger bracts, calyx lobes with ciliate sparse margin, larger bracteoles, persistent during anthesis and orange fruits when ripe. In addition, ethnobotanical knowledge supports the segregation between *Eugenia moda* (cagaita-da-moda) and *Eugenia dysenterica* (cagaita), contributing to the certainty of our findings. Notes on the habitat, distribution, phenology and conservation status of *Eugenia moda* are provided, as well as an comparative table and identification key to separate it from the more similar Cerrado species of *Eugenia* sect. *Pseudeugenia*.

Keywords: Endangered, *Eugenia* sect. *Pseudeugenia*, savanna, taxonomy, traditional knowledge, veredeiros.

Resumo

Nova espécie de *Eugenia* do Cerrado Brasileiro é descrita e ilustrada por fotografias *in situ*. *Eugenia moda* é restrita à Formação Geomorfológica Urucua, onde também ocorre *Eugenia dysenterica*, espécie de maior similaridade morfológica. É facilmente distinguida pela combinação dos seguintes caracteres: ritidoma com crista da fissura aguda, casca viva fibrosa, alburno amarelado, lâminas foliares geralmente com galhas oblongas, catafilos da inflorescência maiores, com base amarelada e ápice ferrugíneo, glabros ou com margem ciliada esparsa, brácteas espatuladas e maiores, lobos calicinais com margem ciliada esparsa, bractéolas maiores, persistentes durante a antese e frutos alaranjados quando maduros. Além

disso, o conhecimento etnobotânico suporta a segregação entre *Eugenia moda* (cagaita-da-moda) e *Eugenia dysenterica* (cagaita), contribuindo para corroborar nossos achados. São fornecidas notas sobre o habitat, distribuição, fenologia e estado de conservação de *Eugenia moda*, bem como, uma tabela comparativa e chave de identificação para separá-la das espécies mais semelhantes de *Eugenia* sect. *Pseudeugenia* do Cerrado.

Introdução

Eugenia L. (Linnaeus 1753), Myrtaceae, é composto por cerca de 1156 espécies (WCSP 2021), com distribuição pantropical e mega diversidade nos neotrópicos, onde supera numericamente os demais gêneros da família (Mazine *et al.* 2018). Esse gênero pode ser separado dos demais da tribo Myrteae De Candolle pela presença de flores geralmente tetrâmeras, inflorescências em racemos, lobos calicinais geralmente livres no botão floral, ovário 2-4-locular, 2-multiovulado, frutos com 1-4 sementes e embrião com cotilédones fusionados em uma massa sólida (Mazine *et al.* 2016).

No território brasileiro a riqueza de espécies de *Eugenia* sobressai diante dos demais gêneros de espécies frutíferas (BFG 2015), com registro de 407 espécies nativas para o país e ocorrência em todos os domínios fitogeográficos (Flora do Brasil 2020). Essa riqueza reportada para o Brasil também é evidenciada nos últimos trabalhos taxonômicos envolvendo o gênero *Eugenia* no Cerrado (Mazine & Souza 2010; Faria & Proença 2012; Mazine & Faria 2013; Sobral *et al.* 2015; Oliveira 2016; Villarroel *et al.* 2016; Sobral *et al.* 2018; Villarroel *et al.* 2018; Mazine *et al.* 2019), representado por 83 espécies, com 29 endêmicas para esse domínio (Flora do Brasil 2020).

Ainda que altamente diverso, a aparente homogeneidade dos verticilos florais de *Eugenia* repercute em lacunas na sistemática vegetal e tratamentos taxonômicos controversos (Landrum & Kawazaki 1997; Lucas & Bünger 2015; Giaretta *et al.* 2018). A complexidade de *Eugenia* levou a ajustes na sua classificação evolutiva, culminando em três subgêneros e 11 seções infra-genéricas, delimitados com base em filogenia molecular e características morfológicas (Mazine *et al.* 2016; Mazine *et al.* 2018).

Eugenia subg. *Pseudeugenia* Mazine & Faria (Mazine *et al.* 2018) contém apenas *Eugenia* sect. *Pseudeugenia* Mazine & Faria (Mazine *et al.* 2016), representada por cerca de 25 espécies (Valdemarin *et al.* 2020), das quais, oito foram descritas nos últimos nove anos (Faria & Proença 2012; Sobral *et al.* 2012; Sobral 2013; Faria *et al.* 2015; Sobral *et al.* 2015; Proença *et al.* 2017; Lourenço *et al.* 2019; Valdemarin *et al.* 2020) e 11 têm registros para o Cerrado (Oliveira 2016; Flora do Brasil 2020).

As espécies de *Eugenia* sect. *Pseudeugenia* são as mais basais do gênero (Mazine *et al.* 2014) e endêmicas da América do Sul, com distribuição pelas Guianas, Suriname, Bolívia, Brasil, Paraguai e Argentina, com provável centro de diversificação nos biomas secos (Mazine *et al.* 2018). O reconhecimento desse grupo (Faria *et al.*, in prep.) se dá principalmente pela presença de inflorescências do tipo racemo auxotélico ou fasciculadas, flores tetrâmeras, geralmente velutinas, bractéolas lineares, decíduas, ovários 2-4 loculares, 1-multiovulados, frutos piriformes, grandes, comestíveis, de coloração amarelada quando maduros e sementes com fusão parcial ou total dos cotilédones (Mazine *et al.* 2016, 2018).

O gênero apresenta grande potencial alimentar e medicinal, o que torna muitas de suas espécies fonte de matérias-primas para a confecção de produtos artesanais ou para o processamento em agroindústrias locais, promovendo a geração de renda em comunidades extrativistas, a proteção dos recursos naturais e a implementação de dietas sustentáveis (Carvalho 2007; Araújo *et al.* 2019; Medeiros & Albuquerque 2020; Silva *et al.* 2021).

Durante o desenvolvimento de estudos de florística em cerrado *sensu stricto* na Área de Proteção Ambiental do Rio Pandeiros (dados não publicados), no norte de Minas Gerais (Brasil), foram encontrados indivíduos similares à *Eugenia dysenterica* (Mart.) DC. (De Candolle 1828: 268), igualmente pertencentes à *Eugenia* sect. *Pseudeugenia*, para os quais a população local atribui nomes vernaculares distintos. Análises morfológicas demonstraram diferenças robustas em relação à *E. dysenterica*. Esses indivíduos não puderam ser enquadrados em nenhuma espécie conhecida e são aqui considerados como pertencentes a uma nova espécie.

Material e Métodos

Foram realizadas observações, registros e coletas de diferentes indivíduos da nova espécie entre janeiro/2019 e julho/2020, permitindo a representação das variações fenológicas. As expedições ocorreram em vegetações de cerrado *sensu stricto* do norte de Minas Gerais, na Área de Proteção Ambiental do Rio Pandeiros, no município de Bonito de Minas. Os materiais botânicos foram depositados no MCCA, RB, NY, HUEFS, UB, HEPH, HST, CEN, BRBA, SP, R, UEC e K (acrônimos dos herbários, segundo Thiers 2020). Na busca por coletas anteriores, foram analisados espécimes de *Eugenia dysenterica* (espécie com similaridade morfológica) e *Eugenia* sp. disponíveis nos herbários virtuais: MCCA, RB, R, UEC, K, NY e HEPH. As características morfológicas de *Eugenia dysenterica* que contrapõe à espécie nova foram fotografadas e analisadas a partir de observações realizadas em campo, de exsicatas e de materiais férteis armazenados em álcool 70%, depositados no MCCA, além disso, fez-se a complementação de seus dados de acordo com o estudo de Faria (2010). Para a descrição morfológica utilizou-se de termos botânicos definidos por Hickey (1973) e Gonçalves & Lorenzi (2011) e descrições para o gênero *Eugenia* (Faria 2010, Sobral 2011, Oliveira 2018, Flora do Brasil 2020, Valdemarin *et al.* 2020). Para a determinação do estado de conservação da nova espécie utilizou-se o software GeoCat (Bachman *et al.* 2011) e seguiu-se os critérios de avaliação da Lista Vermelha da IUCN versão 14 (IUCN 2019). O mapa de distribuição da espécie nova e de sua similar foi feito com o aplicativo QGIS (2019).

Taxonomia

Eugenia moda E.B.Rangel, R.S.Fonseca & D.T.Iglesias, *sp. nov.* **TIPO:**—BRASIL. Minas Gerais: Bonito de Minas, Área de Preservação Ambiental de Uso Sustentável Rio Pandeiros, na beira da BR que liga Januária e Bonito de Minas (rodovia LMG-604), a 8,31 km da sede do município de Bonito de Minas, 854 m, -15.340477, -44.693850, 1 Novembro 2019 (fl.), R. S. Fonseca & D. Arruda 1276 (holótipo MCCA 4386!; isótipo RB!, NY!, HUEFS!, UB!). Figura 1.

Diagnose—*Eugenia moda* se assemelha a *E. dysenterica*, mas se diferencia pelo ritidoma fissurado com cristas agudas (vs. cristas planas), casca viva fibrosa (vs. casca viva farinácea), alborno amarelado (vs. alborno alaranjado), folhas geralmente com galhas oblongas (vs. raro galhas elipsoides), catafilos maiores 3,2-9,0 mm compr. (vs. 1,0-2,9 mm) com base amarelada e ápice ferrugíneo (vs. ferrugíneos), glabros ou com margem ciliada esparsa branca (vs. catafilos rubro-tomentosos ao menos na margem), brácteas (6)8(15) mm compr. (vs. (2)3(6) mm) espatuladas (vs. lineares), lobos calicinais com margem ciliada esparsa (vs. glabro-pubérulo, ápice tomentoso), bractéolas maiores 3,6-6,0 mm compr. (vs. 0,9-3,2 mm), persistentes durante antese (vs. decíduas) e frutos laranja quando maduros (vs. amarelos). Figuras 1 e 2.

Descrição—Arbusto a arvoreta 0,5-3 m. Caule com ritidoma acinzentado, suberoso e fissuras de crista aguda, textura fibrosa, alborno amarelado; ramos jovens com coléteres euriformes. Folhas opostas, glabras; pecíolos 3,0-11,7 x 1,1-2,2 mm; lâminas foliares 2,7-10,0 x 1,9-7,9 cm, ovadas, base sempre decurrente, arredondada a truncada, raro cuneada; ápice acuminado, agudo a atenuado; pontuações castanhas salientes, mais evidentes na face abaxial; nervura média levemente saliente na face adaxial e saliente na face abaxial da lâmina foliar; 7-10 pares de nervuras laterais, nervura marginal ausente. Inflorescências racemos auxotéticos, flores tetrâmeras, catafilos imbricados, ovados a espatulados, 3,2-9,0 mm compr., côncavos, base amarelada, ápice ferrugíneo, glabros ou com margem ciliada esparsa, tricomas esbranquiçados, brácteas (6)10(15) mm compr., espatuladas, margem ciliada esparsa, tricomas brancos, raro âmbar, pontuações salientes castanhas, ferrugíneas a enegrecidas; raque ausente ou até 3,2 mm compr., coléteres euriformes; pedicelo 8,7-37,3 mm compr., glândulas salientes enegrecidas, região apical com coléteres euriformes; bractéolas livres, 3,6-6,0 mm compr., lineares, ápice subulado a agudo, glabras ou com margem esparsa ciliada, persistentes durante a antese; botões florais 3,5-6,3 mm diâm.; hipanto glabro, glândulas salientes enegrecidas; lobos calicinais 4, livres, 3,0-6,1 x 3,0-6,4 mm, ovados a deltoides, ápice obtuso a arredondado, margem ciliada esparsa, tricomas esparsos esbranquiçados, relativamente maiores na porção apical, glândulas salientes enegrecidas na face abaxial; pétalas 4, alvas, 8,0-14,2 mm compr., obovadas, ápice arredondado a obtuso, margem cilada, tricomas brancos, glândulas salientes, esparsas e translúcidas; disco estaminífero glabro, estames 84-105, filetes 3,5-9,7 mm compr., anteras elípticas; estilete 7,0-9,4 mm compr., glabro; ovário 2(3)-locular, glabro internamente, 1-3 óvulos por lóculo. Fruto laranja quando maduro, 16,8-27,7 x 17,6-29,9 mm, globoso-piriforme, glabro, glândulas salientes enegrecidas; 1-2 sementes, 9,6-16,2 x 8,4-18,0mm, testa coriácea.

Distribuição e Habitat—*Eugenia moda* ocorre em solos arenosos do cerrado *sensu stricto* advindos da Formação Geomórfológica Urucuia, na Área de Proteção Ambiental do Rio Pandeiros, região norte de Minas Gerais, entre 8,31-20 km da sede do município de Bonito de Minas, à elevações de 653-854 m. Figura 3.

Fenologia—Espécie sazonal, caducifólia durante o período seco, nos meses de abril a setembro; em outubro e novembro ocorre a fase de brotamento e de floração. A frutificação acontece em novembro e dezembro, durante o período úmido e chuvoso.

Nomes vernaculares—Cagaita-da-moda, cagaitinha-da-moda, cagaita-da-China, cagaita-da-Índia, cagaitinha, laranjinha-do-campo e cagaitinha-da-campina.

Etimologia—O epíteto específico “*moda*” se refere ao vernáculo cagaita-da-moda, nome amplamente utilizado pelos Veredeiros, que são comunidades tradicionais associadas às veredas (fitofisionomia do Cerrado) e que habitam a região de ocorrência da espécie nova. Esse vernáculo alude à grande semelhança com a “*cagaita*” (*Eugenia dysenterica*), outra frutífera comum na localidade, mas também diz respeito à singularidade da mesma quando se diz que “ela tem a sua própria moda”. O nome científico escolhido representa uma homenagem aos Veredeiros, que já estabelecem relações ecológicas com a novidade botânica a pelo menos 80 anos e reconhecem sua identidade a partir de caracteres morfológicos, fenológicos e sensoriais, corroborando nossas análises.

Status de conservação—*Eugenia moda* foi apontada pelo Geocat como espécie vulnerável, devido a extensão de ocorrência (EOO) de 5.275,654 km² e como ameaçada de extinção, com base em uma área de ocupação (AOO) de 24.000 km². Contudo, a espécie nova é subamostrada, devendo-se considerar apenas a extensão de ocorrência. Dessa forma, de acordo com a avaliação pelos critérios da IUCN (2019), ela é classificada como espécie vulnerável (VU), critério B1 b (i,ii,iii), por apresentar uma extensão de ocorrência (EOO) estimada menor que 20.000 km² e alta exposição às situações de ameaça, como alterações climáticas, desmatamento, queimadas, reflorestamento com eucalipto e atividades

agropastoris, podendo inferir-se em um declínio contínuo na extensão de ocorrência, na área de ocupação e qualidade do habitat.

Parátipos—Brasil. MINAS GERAIS: Bonito de Minas, Área de Proteção Ambiental do Rio Pandeiros, -15.3233003616333°, -44.75439834594°, 653 m, 17 Novembro 2018, *J. E. Silveira; R. S. Fonseca s.n.* (MCCA 2891!); idem, -15.3233003616333°, -44.753983459473°, 653 m, 11 Novembro 2018, *J. E. Silveira; R. S. Fonseca s.n.* (MCCA 2892!); idem, -44.916722°, -15.232277°, 653 m, 15 Julho 2019, *E. B. Rangel, R. S. Fonseca & D. I. Tavares 1261* (MCCA 4397!); idem, -44.902600°, -15.218297°, 653 m, 15 Julho 2019, *E. B. Rangel, R. S. Fonseca & D. I. Tavares 1265* (MCCA 4401!); idem, -44.902661°, -15.218325°, 653 m, 15 Julho 2019, *E. B. Rangel, R. S. Fonseca & D. I. Tavares 1262* (MCCA4398!); idem, -44.902636, -15.218311°, 653 m, 15 Julho 2019, *E. B. Rangel, R. S. Fonseca & D. I. Tavares 1263* (MCCA 4399!); idem, 15 Julho 2019, *E. B. Rangel, R. S. Fonseca & D. I. Tavares 1264* (MCCA4400!); idem, 15 Julho 2019, *E. B. Rangel, R. S. Fonseca & D. I. Tavares 1260* (MCCA4396!); idem, 27 Outubro 2019 (fl.), *E. B. Rangel 20* (MCCA 4402!); idem, -15.340477°, -44.693850°, 854 m, 01 Novembro 2019 (fl.), *R. S. Fonseca & D. Arruda 1277* (MCCA4387!); idem, 01 Novembro 2019 (fl.), *R. S. Fonseca & D. Arruda s.n.* (MCCA 4388!); idem, 01 Novembro 2019 (fl.), *R. S. Fonseca & D. Arruda s.n.* (MCCA 4389!); idem, 01 Novembro 2019 (fl.), *R. S. Fonseca & D. Arruda 1278* (MCCA 4390!); idem, -15.225425°, -44.916494°, 653 m, 05 Novembro 2019 (fl.), *E. R. Martins & V. F. Oliveira s.n.* (MCCA 4391!); idem, 05 Novembro 2019 (fl.), *E. R. Martins & V. F. Oliveira s.n.* (MCCA 4392!); idem, 05 Novembro 2019 (fl.), *E. R. Martins & V. F. Oliveira s.n.* (MCCA 4393!); idem, 05 Novembro 2019 (fl.), *E. R. Martins & V. F. Oliveira s.n.* (MCCA 4394!); idem, 05 Novembro 2019 (fl.), *E. R. Martins & V. F. Oliveira s.n.* (MCCA 4395!).



FIGURA 1. *Eugenia moda*. **A.** Ritidoma (em destaque, crista da fissura aguda). **B.** Alburno (seta branca). **C.** Lâmina foliar com galhas oblongas (meia seta preta). **D.** Catafilo (seta preta) e bráctea (seta pontilhada preta). **E.** Fruto maduro.



FIGURA 2. *Eugenia dysenterica*. **A.** Ritidoma, crista da fissura plana (seta preta). **B.** Alburno (seta branca). **C.** Lâmina foliar com galhas elipsoides. **D.** Catafilos (seta pontilhada branca) e brácteas (seta pontilhada preta). **E.** Fruto maduro.

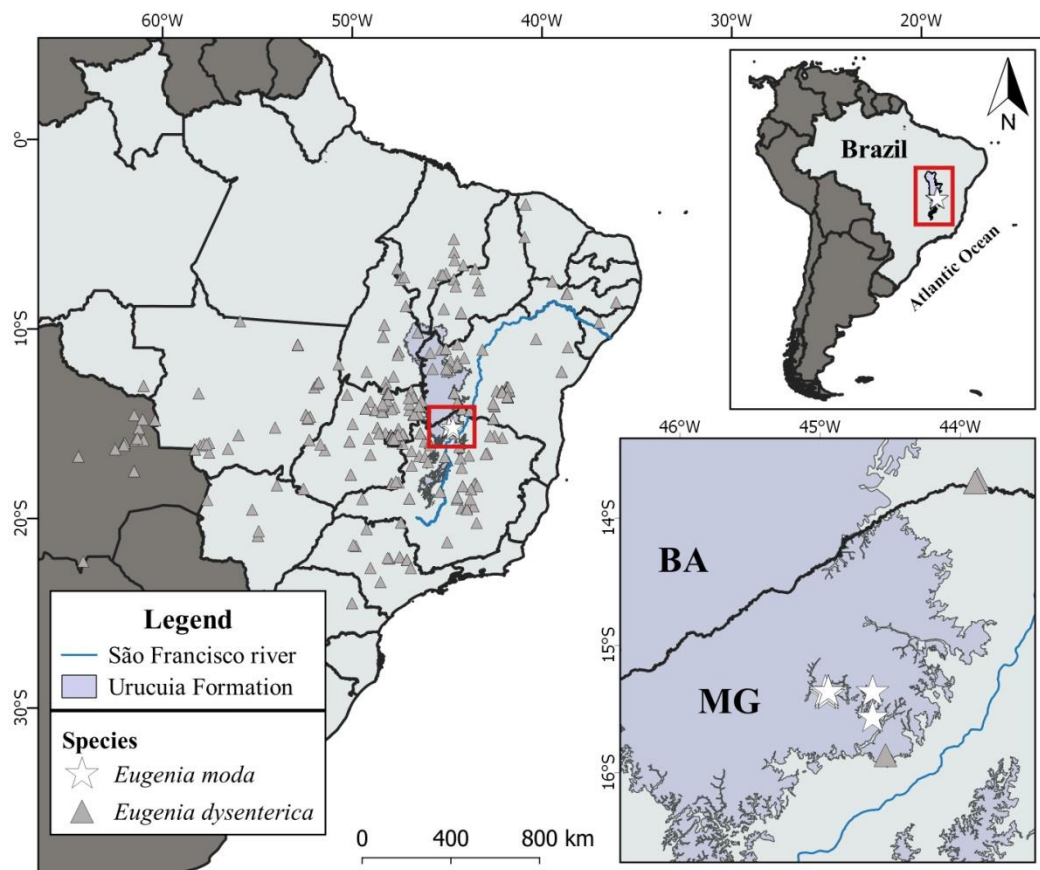


FIGURA 3. Localidades conhecidas de *Eugenia moda*, imersas na Formação Geológica Urucua, em contraste a ampla ocorrência de *Eugenia dysenterica*, espécie com qual compartilha de maior similaridade morfológica.

Discussão—*Eugenia moda* pode ser agrupada dentro de *Eugenia* sect. *Pseudeugenia*, devido à presença de inflorescências do tipo racemo auxotélico, bractéolas lineares e decíduas, botão floral com lobos do cálice livres, ovário 2(3)-locular, 1-3 óvulos por lóculo, frutos grandes, piriformes e comestíveis.

A espécie se assemelha a *Eugenia dysenterica*, espécie também pertencente a *Eugenia* sect. *Pseudeugenia*, principalmente devido ambas apresentarem ritidoma fissurado com textura suberosa, folhas ovadas, racemos auxotélicos, bractéolas lineares e decíduas, sépalas ovadas a deltoides, ovário bilocular, glabro, com 1-3 óvulos por lóculo, frutos grandes, glabros, carnosos, globosos e comestíveis. Contudo, se diferenciam facilmente devido aos caracteres referentes à crista da fissura do ritidoma, textura da casca viva, cor do alburno, tamanho, cor e indumento dos catafilos, tamanho e forma das brácteas, tamanho e persistência das bractéolas durante a antese, indumento dos lobos calicinais e à cor dos frutos maduros (Tabela 1).

Além das características morfológicas úteis para o reconhecimento destas espécies, a ecologia também as distingue. *E. moda* frequentemente apresenta galhas oblongas em suas folhas, que, embora não seja propriamente um caractere morfológico, confere como aspecto diagnóstico adicional para identificação e separação das espécies (Maia *et al.* 2005; Carneiro *et al.* 2009; Queiroz-Lima *et al.* 2018; Maia 2019), tanto em campo, quanto em material testemunho. Em *E. dysenterica*, também há registros de galhas foliares, neste caso, elipsoides (Rocha *et al.* 2019). Além disso, elas se diferenciam quanto à amplitude geográfica que ocupam. *E. moda* se restringe aos solos arenosos do cerrado *stricto sensu*, no norte de Minas Gerais e possivelmente, no oeste da Bahia (ver as exsicatas dos herbários RB: BRBA 001982, HST 13891 e HEPH: SP 024338, SP 314654, CEN 00016870, CEN16870), formando um *continuum* entre estas regiões (Oliveira 2013; Silva 2019). Por outro lado, *E. dysenterica* apresenta ampla distribuição geográfica (Figura 3), com registros para o Brasil no Tocantins, Bahia, Ceará, Maranhão, Pernambuco, Piauí, Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso, Minas Gerais e São Paulo, em vegetações de cerrado *lato sensu*, caatinga e mata atlântica (Flora do Brasil 2020).

Eugenia moda também se assemelha a *E. gemmiflora* O.Berg (Berg 1857: 223) e *E. arenosa* Mattos (Mattos 1970: 42), pois compartilham caracteres como inflorescência do tipo racemo auxotélico, frutos grandes de formato piriforme ou globoso e com superfície lisa. No entanto, claramente se diferenciam quanto à presença de galhas foliares, tamanho e forma das brácteas, tamanho, deciduidade e indumento das bractéolas, indumento dos lobos calicinais e cor dos frutos maduros. A tabela 1 e a chave de identificação apresentam a diagnose que distingue *E. moda* das espécies mais relacionadas de *Eugenia* sect. *Pseudeugenia* do Cerrado.

TABELA 1. Caracteres diagnósticos de *Eugenia moda* e espécies mais relacionadas de *Eugenia* sect. *Pseudeugenia* do Cerrado.

Caracteres	<i>Eugenia moda</i>	<i>Eugenia dysenterica</i>	<i>Eugenia gemmiflora</i>	<i>Eugenia arenosa</i>
Galha foliar	Oblonga. Poucas a muitas. Raro sem galhas.	Elipsoide. Raro com galhas.	Registros não encontrados	Registros não encontrados
Comprimento das brácteas (mm)	(6)8(15)	(2)3(6)	2,0-4,3	Até 5,0
Forma das brácteas	Espatulada	Linear	Lanceolada	Deltoide a linear
Comprimento das bractéolas (mm)	3,6-6,0	0,9-3,2	1,7-2,6	4,0-5,5
Deciduidade das bractéolas	Decíduas durante a antese	Decíduas antes da antese	Decíduas ou persistentes nos frutos	Decíduas antes da antese
Indumento dos lobos calicinais	Glabras, margem ciliada	Glabro a pubérulo, ápice tomentoso	Pubescente, margem ciliada	Esparsa-tomentosa em ambas as faces, margem ciliada
Coloração dos frutos maduros	Laranja	Amarelo	Vinoso	Amarelo

Chave de identificação de *Eugenia moda* e demais espécies de *Eugenia* sect. *Pseudeugenia* do Cerrado mais relacionadas

1. Folhas com nervura marginal ausente; brácteas deltoides, lineares ou espatuladas, glabras, margem ciliada ou esparsa-tomentosa a tomentosa; bractéolas lineares ou orbiculares, glabras, com margem ciliada ou tomentosa.....**2**
1. Folhas com nervura marginal dupla; brácteas lanceoladas, densamente pilosas; bractéolas lanceoladas, densamente pubescentes.....***Eugenia gemmiflora***
2. Hipanto glabro; pétalas obovadas ou elípticas.....**4**
2. Hipanto esparsa-tomentoso; pétalas espatuladas.....***Eugenia arenosa***
3. Ritidoma com cristas agudas; casca viva farinácea; alburno alaranjado; catafilos da inflorescência 1,0-2,99 mm compr., ferrugíneos, rubro-tomentosa na margem ou também na face adaxial; frutos obovados, amarelos quando maduros.....***Eugenia dysenterica***
3. Ritidoma com cristas planas; casca viva fibrosa; alburno amarelado; catafilos da inflorescência 3,24-9,0 mm compr., base amarelada e ápice ferrugíneo, glabros ou com margem ciliada esbranquiçada; frutos piriformes, laranja quando maduros.....***Eugenia moda***

Conclusões

Nova espécie do gênero *Eugenia*, nativa do cerrado brasileiro, é descrita e nomeada cientificamente após a comprovação de sua identidade por comunidades tradicionais denominadas de Veredeiros.

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ANEXO I - Normas de submissão da revista

Aim and scope

Phytotaxa is a peer-reviewed, international journal for rapid publication of high quality papers on any aspect of systematic and taxonomic botany, with a preference for large taxonomic works such as monographs, floras, revisions and evolutionary studies and descriptions of new taxa. *Phytotaxa* covers all groups covered by the International Code for Botanical Nomenclature, ICBN (fungi, lichens, algae, diatoms, mosses, liverworts, hornworts, and vascular plants), both living and fossil. *Phytotaxa* was founded in 2009 as botanical sister journal to *Zootaxa*. It has a large editorial board, who are running this journal on a voluntary basis, and it is published by Magnolia Press (Auckland, New Zealand). It is also indexed by SCIE, JCR and Biosis. All types of taxonomic, floristic and phytogeographic papers are considered, including theoretical papers and methodology, systematics and phylogeny, monographs, revisions and reviews, catalogues, biographies and bibliographies, history of botanical explorations, identification guides, floras, analyses of characters, phylogenetic studies and phytogeography, descriptions of taxa, typification and nomenclatural papers. Monographs and other long manuscripts (of 60 printed pages or more) can be published as books, which will receive an ISBN number as well as being part of the *Phytotaxa* series.

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The most recent version of the ICBN should be applied (until 2011, this is the Vienna Code, 2006, after which the Melbourne Code will take precedence). Author(s) of taxon names (from the rank of genus or below) must be provided when the scientific name of any plant species is first mentioned with the year of publication. These are cited as a full reference and should be included in the reference list.

Type of Manuscripts

Based on their length, three categories of papers are considered:

1) Research article

Research articles are significant papers of four or more printed pages reporting original research. Papers between 4 and 59 printed pages are published in multi-paper issues of ca. 60

pages. Monographs (60 or more pages) are individually issued and bound and will receive ISBN numbers as well as being part of the *Phytotaxa* series.

Phytotaxa encourages large comprehensive taxonomic works. There is no upper limit on the length of manuscripts, although authors are advised to break monographs of over 1000 pages into multi-volume contributions simply because books over 1000 pages are difficult to bind and too heavy to carry.

Short papers on species of economic, environmental or phylogenetic importance may be accepted at the discretion of editors, who will generally encourage and advise authors to add value to the paper by providing more information (e.g. key to species of the genus, biological information, ecology, etc.). Papers of 4 or 5 pages accepted for publication may be shortened for publication in the Correspondence section.

2) Correspondence

Manuscripts of one to four pages are welcome. We can publish these fairly rapidly because they are useful to fill blank pages in multi-paper issues. *Phytotaxa* publishes the following six types of correspondence:

1. Opinions and views on current issues of interests to systematic botanists.
2. Commentaries on or additions/corrections to papers previously published in *Phytotaxa* or elsewhere.
3. Obituaries of botanists.
4. Taxonomic/nomenclatural notes.

5. Book reviews meant to introduce readers to new or noteworthy taxonomic works (interested authors/publishers are advised to contact the editor before submitting books for review; editors then prepare the book review or invite colleagues to write the review; unsolicited reviews are not usually published).
6. Short papers converted from manuscripts submitted as research articles but too short to qualify as such.

These short contributions should generally have no more than 20 references (exceptions may be considered), and the total length should not exceed four printed pages. Neither an abstract nor a list of key words is needed; major headings (Introduction, Material and Methods, etc.) should not be used, except for new taxon headings and References. A typical correspondence should consist of (1) a short and concise title, (2) author name, affiliation, address and e-mail address, (3) a series of paragraphs being the main text, and (4) a list of references (if any). The first or last paragraph may be a short summary.

Commentaries on published papers are intended for scholarly exchange of different views or interpretations of published data and should not contain personal attack; note that authors of the papers concerned may be invited to reply to comments on their papers.

3) Monographs, floras and other articles of more than 60 printed pages

Appear in book-form with their own ISBN number. They may be different from the standard formatting when the author provides reasonable arguments for doing so. Please consult the editor in such cases.

Special issues

Special issues with collected papers on a selected topic in the scope of the journal are also published. Potential guest editors should send a proposal to the chief editor for approval and instructions. Although guest editors for special issues are responsible for organizing the peer review of papers in these issues, they must follow the style of *Phytotaxa* (as laid out in this author guide) and peer review procedures. If any papers by the guest editors are to be included in the special issue, these papers must be handled by editors/colleagues other than the editor(s) involved. Special issues must be 60 or more pages. Funding may be required to offset part of the production costs. Author payment for Open Access is strongly encouraged. Reprints can be ordered for the entire issue or for individual papers.

Preparation of manuscripts

General

Please read the guidelines below and additionally consult a recent article published in *Phytotaxa* and follow the style therein.

Language. The article has to be written in British or American English throughout the manuscript. Authors whose native language is not English are encouraged to ask colleagues familiar with the field of research and fluent in English (preferably a native speaker) to correct the language in the manuscript before submission. An article may be returned to the author without review if the language is not of an acceptable standard.

The author is also responsible for the correct usage of other languages, be it a Latin diagnosis or an abstract in a foreign language. The grammar of texts in foreign languages needs to be checked by the author before submission, and again after review if the English from which it is translated (e.g. an abstract) has changed. Latin scholars who are consulted for the correcting of diagnoses should be acknowledged.

Metric measures should be used. Please use the common font Times New Roman, 12 pt and as little formatting as possible (apply only **bold** and *italics* where necessary and indent paragraphs except the first). Special symbols can be used but need to be carefully checked by the author at proof stage, because they may be altered due to incompatibility of files.

Hyphens ‘-’ are used to link words such as personal names, topographical names, some prefixes and compound adjectives that could otherwise be confused (examples: well-established, 5-sided, Kingston-upon-Thames, Kingdon-Ward, co-operation, etc.).

En-dash or en-rule ‘—’ (a dash the length of the letter ‘n’) should be used for ranges or spans. In the context of *Phytotaxa* it is mainly used for ranges of numbers, most frequently size ranges, elevational ranges, dates and page numbers (e.g. 500–1000 m, 1–3 May, 1976–1977, figs 5–7). Remember also to apply them in the reference section for ranges of volumes, years and pages. The en-dash is also used in name associations (e.g. a Federal–State agreement) and in phenology (e.g. flowering May–September).

Em-dash or em-rule ‘—’ (the length of the letter ‘m’) is used infrequently; they are used for breaks in the text or subject. In contrast to parentheses an em-dash can be used alone; e.g. “What could these results mean—that John discovered the meaning of life?” Em-dashes are also used after a subheading, for instance:

“Type:—BRAZIL . Paraná: Ponta Grossa, Furnas Gêmeas, remnant *Araucaria* forest below large sandstone cliff, 25.145°S, 049.958°W, 950–1000 m, 16 February 2008, *Christenhusz et al. 4790* (holotype SP!, isotypes K!, MBM, NY!, P!, TI, TUR!, UC!, UPCB).”

Exclamation mark ‘!’ is used to indicate after the herbarium acronym to indicate that this voucher specimen has been seen by the author (see above).

Multiplication or times sign ‘×’. The multiplication sign × is not to be confused with the letter x. It should always be used in hybrid taxa (e.g. *Equisetum × schaffneri*) and in measurements of length and width (of leaves or petals, for example), for example: “leaves 1.0–4.2 × 0.4–0.8 cm”.

Dashes and hyphens should not be spaced. Please feel free to copy these symbols from this author guide and paste them into your manuscript. Using the correct symbols will speed up the editing process. Editors may return the manuscript to the author if dashes, hyphens and multiplication signs are not correctly used.

Italicisation. Generic names and all ranks below are italicised. Book and journal titles are also in italics, as well as diagnoses in Latin and Latin abbreviations (such as *sp. nov.*, *comb. nov.*, *nom. illeg.*, *et al.*). “subsp.”, “ser.”, “var.”, “cv.” and “f.” (for forma or filius) are not italicised, nor are names above the rank of genus. The abbreviation “ssp.” should be avoided and replaced by “subsp.” (for subspecies) to prevent confusion with the abbreviation spp. (= species in plural). As a general rule abbreviations are discouraged.

Abbreviations of certain words are standardised: ca. = circa, m = meter, cm = centimeter, dbh = diameter at breast height, elev. = elevation (altitude is not used for heights of land surfaces above sea level; altitude is used for heights above the earth surface, e.g. of an airplane), *sp. nov.* = new species, *comb. nov.* = new combination, *gen. nov.* = new genus, subsp. = subspecies, sect. = section, pers. comm. = personal communication, etc. Herbarium acronyms follow *Index Herbariorum* <http://sweetgum.nybg.org/ih/>

Citation of author names

Author abbreviations are seldom used (generally only for basionym authors and new taxa proposed in the manuscript); they are generally cited fully in the references. This means that

the name is not abbreviated but the surname is written in full, followed in brackets by the year of publication, a colon, and the page number of the page where the name was published. This is treated as a normal citation, and thus the full article in which the species was published has to be cited in the references. (Include full title of the article, full journal title and full page range.) This is obligatory for all taxonomic articles and articles in which fewer than 30 taxa are mentioned. In articles that deal with a larger number of species (such as ecological or phylogenetic studies or checklists) this is not encouraged because it is impractical. If uncertain, please contact an editor about this matter.

Author abbreviations (strictly following IPNI) are only used in larger monographs and checklists, but even in these articles names in introductions and running text are properly cited in the references. Taxon author names should be cited only once, when the taxon/species first appears in the text. *Phytotaxa* aims to have all taxonomic sources cited included in the reference section. Citation of species authors is as follows:

- *Hymenophyllopsis asplenioides* A.C.Sm. in Gleason (1931: 302). Smith is abbreviated here because it is published in Gleason, which is the proper article to cite.
- *Cyathea asplenioides* (A.C.Sm.) Christenhusz (2009: 39). Smith is abbreviated here because the basionym is already given above.
- *Cyathea gibbosa* (Klotzsch 1844: 542) Domin (1929: 262). Both the basionym and new combination are cited because the basionym is not given above.

In the references:

Christenhusz, M.J.M. (2009) New combinations and an overview of *Cyathea* subg. *Hymenophyllopsis* (Cyatheaceae). *Phytotaxa* 1: 37–42.

Domin, C. (1929) *Pteridophyta*. České Akademie, Prague. 276 pp.

Gleason, H.A. (1931) Botanical results of the Tyler-Duida expedition. *Bulletin of the Torrey Botanical Club* 58: 227–344.

Klotzsch, J.F. (1844) Beiträge zu einer Flora der Äquinoctial-Gegenden der neuen Welt, Filices. *Linnaea* 18: 525–556.

Deposition of voucher specimens and GenBank numbers

Authors of new taxa are required to deposit type specimens in national or international public museums or collections, preferably ones listed in the *Index Herbariorum* that are provided with a corresponding acronym.

Authors are also advised to request registration numbers of deposited sequences in GenBank in advance of the submission of papers to avoid unnecessary delay of publication. Descriptions of species can also be linked to other sources such as the *Encyclopedia of Life*. For fungi MycoBank numbers need to be provided.

Some countries (e.g. Australia, Brazil, Peru) require that primary type specimens (holotypes) be deposited in collections in the country of origin; authors are advised to take this into consideration.

Geography and elevation

Please apply the word ‘elevation’ when dealing with geological features. ‘Altitude’ is here defined as the distance above the surface of the Earth, whereas ‘elevation’ applies to the height of an earth surface above sea level.

For country names (always capitalised in specimen citations) and provinces (followed by a colon), the standard spellings in English followed by the UN apply (e.g. Kyrgyzstan not Kirghizia , Madagascar not Malagasy Republic etc.). For a standard list of countries and areas see: <http://unstats.un.org/unsd/methods/m49/m49alpha.htm>. Exceptions may be discussed with the editor.

Title

The title should be concise and informative and should cover the content of the article. No author names of taxa are given in the title. Family names should always be included. The higher taxa containing the taxa dealt with in the paper (when appropriate) should be indicated in parentheses, example: **A taxonomic revision of the genus *Aa* (Cranichidae, Orchidoideae, Orchidaceae).**

Names and affiliations of article author(s)

Names of all authors must be given below the title and should be typed in upper case (e.g. ADAM J. SMITH, BRIAN SMITH & CAROL SMITH). Inclusion of all major contributors to the work should be considered.

Below the names, the address(es) of professional affiliation for each author should be given in *italics* each starting on a separate line. E-mail address(es) should be provided if available. Affiliation addresses are linked to the author names by numbers in superscript and are provided in corresponding order.

Abstract

The abstract should cover concisely contents of the paper and should be phrased such that additional key words are not necessary. Any new names or new nomenclatural acts proposed in the article should be mentioned. No taxon author names are to be included in the abstract. Introductory information should not be included in the abstract, neither should be the citation of references.

Abstracts in other languages using the Latin alphabet may also be included in addition to English and should be a direct translation of the English abstract. The spelling and grammar of these abstracts in other languages is the responsibility of the author. An abstract in another language should be corrected if there are any changes in the English abstract during the editorial process.

Key words

Key words may be given when the abstract does not already cover these. The key words may not include words that are already in the title, and they should be given in alphabetical sequence.

Abstracts and key words are not included in short Communications.

Introduction

The introduction should place the study in context, and it should provide recent or historical background relevant to the study. This information should not be included in the abstract. Author names of a taxon should be cited only once, when the taxon/species first appears in the text.

Material & Methods

Materials and methodology used in empirical studies should be concisely provided. Herbaria consulted can be listed here, if not done so in the Acknowledgements. Field work should be highlighted. Floras and other taxonomic works consulted to identify the plant material involved in a study should be cited.

Results

The results section should only present the results of the study. Do not mix results and discussion. Combined Results/Discussion sections are discouraged. Citations of other literature are not normally permitted in the Results section.

Discussion

Discuss your results and place these in the context of the introduction.

Conclusion

The conclusion should state what the scientific contribution of your study is (ask yourself the question: ‘What can we learn from this study and how do the results help us to understand the questions asked in the introduction and discussion?’). It is helpful for other researchers to point out further studies that may be needed in the future.

Taxonomy

A taxonomy section should start with each taxon in bold italics. Abbreviations of authors of new species should be given (following IPNI, not bold), and these should be followed by the correct designation (in italics, not bold, e.g. *comb. nov.*, *nom. nov.*, *spec. nov.*, *stat.*

nov., etc.). When species are not newly described, the author names should be followed by the year and page of publication (and the full article should be included in the references).

All new taxa need to be accompanied by short diagnoses in English or Latin that describe the new taxa. If you prefer Latin, please make sure the language is used correctly. The editors will generally not correct your Latin diagnoses. A specimen needs to be designated as its type (following the ICBN), and the holotype must have been studied by the author of the species. It is encouraged that, when possible, the holotype is deposited in the country of origin, and that two or isotypes are deposited in major herbaria where the specimens will be available for public study.

Taxonomic descriptions should be organised describing the plants from below to above and from outside towards the inner parts. Of course, this is different for each taxon and can thus follow a variable. Subsections of descriptions can be highlighted using italics. Additional data (e.g. distribution, ecology, etymology, etc.) may follow. Often these are subheaded by ‘:—’ (m-dash).

Specimens are cited as follows:

COUNTRY. Province: Locality, elevation, coordinates, date (day month (in full) year), *Collector number* (herbarium acronym in upper case). All specimens studied should be cited. Lectotypes, neotypes and epitypes should always be followed by the reference where they are designated, for example:

Lectotype (designated by Smith 2000/designated here):—FINLAND .
Uusimaa: Helsinki, Kaisaniemi Park, 27 April 1976, *Virtanen* 22 (H!).

Keys

Identification keys should be dichotomous, and the leads should (preferably) be opposite to each other in meaning so that the species can be easily distinguished. Please do not format the key; provide it in the following simple layout:

1. Bracts longer than pedicels; filaments with 1 acute lobe at apex on either side of anther

... *Ornithogalum nutans*

- Bracts shorter than pedicels; filaments without apical lobes on anther ... 2.

2. Inflorescence corymbose; tepals longer than 14 mm ... *Ornithogalum angustifolium*

- Inflorescence racemose; tepals shorter than 14 mm ... *Ornithogalum pyrenaicum*

Acknowledgements

The format for the Acknowledgements is variable, and anyone can be thanked for their contribution. Please consider co-authorship for people that contributed to the study in a major way, especially contributors of specimens or laboratory work.

References

All literature cited in the text (including full articles of taxon authors) should be included. Please check this carefully before submission because errors are common. References should be cited in the text as Smith (1999), Smith & Jones (2000) or Smith *et al.* (2001), the latter when there are three or more authors, or alternatively in a parenthesis (Adams 2000, Smith & Jones 2000, Jones 2001, Smith *et al.* 2001). The citation of floras, revisions and monographs used to identify the collections on which the study is based is strongly encouraged.

Please include DOI for papers that have these. This facilitates linking to papers that have online versions.

Journal article: Author, A. & Author, B.C. (YEAR) Title of the paper. *Title of the journal in full in italics* volume: x–y. For example:

Christenhusz, M.J.M., Zhang, X.-C. & Schneider, H. (2011) Linear sequence of extant families and genera of lycophytes and ferns. *Phytotaxa* 19: 7–54.

Book chapter: Author, A. & Author, B.C. (YEAR) Title of the chapter. *In:* Author, A., Author, B.C. & Author, D. (Eds.) *Title of book in italics*. Publisher name, City, pp. x–y. For example:

Schneider, H., Kreier, H.-P., Janssen, T., Otto, E., Muth, H. & Heinrichs, J. (2010) Key innovations versus key opportunities: identifying causes of rapid radiations in derived ferns. *In:* Glaubrecht, M. (Ed.) *Evolution in action*. Springer, Berlin, pp. 61–76.

Book: Author, A. & Author, B.C. (YEAR) *Title of book in italics*. Publisher name, location, xyz pp. For example:

Copeland, E.B. (1947) *Genera filicum*. Chronica Botanica, Waltham, Massachusetts, 247 pp.

Internet source: Author, A. (YEAR) *Title of website, database or other resources*, Publisher name and location (if indicated), number of pages (if known). Available from: <http://xxx.xxx.xxx/> (Date of access). For example:

IUCN (2010) *The IUCN red list of threatened species*, version 2010.4. IUCN Red List Unit, Cambridge U.K. Available from: <http://www.iucnredlist.org/> (accessed: 19 May 2011).

Dissertations resulting from graduate studies and non-serial proceedings of conferences/symposia are to be treated as books and cited as such. Articles not cited in the manuscript should not be included in the References section.

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Legends of figures and tables should be listed after the list of references within the same file of the manuscript. Legends for tables and figures should start with **TABLE** or **FIGURE** followed by its number and a full stop. Illustrators and photographers should be mentioned in the figure legend, and if the illustrator is not one of the authors he/she should also be acknowledged. All figures and tables need to be referred to in the text.

Example:

FIGURE 1. Distribution map of *Psilotum nudum* in the Caribbean region.

When preparing illustrations, authors should bear in mind that the journal has a matter size of 25 cm by 17 cm and is printed on A4 paper. For species illustrations, line drawings are preferred, although good quality black and white or colour photographs are also acceptable. See a guide [here](#) for detailed information on preparing plates for publication; this guide was prepared by Dr Daniel Geiger for *Zootaxa*, but it applies equally to *Phytotaxa*.

Line drawings must be scanned at 600 to 1200 dpi as line art (bitmap, =1 bit); they must NOT be scanned as 8 bit or full colour images. Pictures and line drawings should be saved as TIFF files. In some cases PDF or DOC files are acceptable. JPG is not an accepted format. Do not scan line drawings as JPG files because this creates blurry or pixellated images. Sufficient resolution should be provided, but it is up to the author to do so. Low resolution figures can only be printed at a small size.

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Please follow the above guidelines in detail and check if your manuscript has been prepared according to the style and format of the journal. When you submit your manuscript, it will be more expedient for the review process if you provide the names of three or more potential reviewers with their email addresses.

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- 1) All authors agree to its submission and the corresponding author has been authorised by co-authors
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- 2) Author last name and running title (<60 characters; to be used in footer)
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References

Angiosperm Phylogeny Group [APG III] (2009) An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III. *Botanical Journal of the Linnean Society* 161: 105–121. DOI: 10.1111/j.1095-8339.2009.00996.x (see also <http://mapress.com/phytotaxa/content/2011/f/pt00019p134.pdf>)

Christenhusz, M.J.M., Zhang, X.-C. & Schneider, H. (2011a) Linear sequence of extant families and genera of lycophytes and ferns. *Phytotaxa* 19: 7–54. <http://mapress.com/phytotaxa/content/2011/f/pt00019p054.pdf>

Christenhusz, M.J.M., Reveal, J.L., Farjon, A., Gardner, M.F., Mill, R.R. & Chase, M.W. (2011b) A new classification and linear sequence of extant gymnosperms. *Phytotaxa* 19: 55–70. <http://mapress.com/phytotaxa/content/2011/f/pt00019p070.pdf>

Important links

- Botanicus: <http://www.botanicus.org/>
- Gallica: <http://www.gallica.fr/>

- Biodiversity heritage library: <http://biodiversitylibrary.org>
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