



<http://dx.doi.org/10.11646/zootaxa.3754.3.1>

<http://zoobank.org/urn:lsid:zoobank.org:pub:B36E65F9-491C-4231-91AF-B41621F1F5E2>

## Large carpenter bees in Argentina: systematics and notes on the biology of *Xylocopa* subgenus *Neoxylocopa* (Hymenoptera: Apidae)

MARIANO LUCIA, LEOPOLDO J. ALVAREZ & ALBERTO H. ABRAHAMOVICH

*División Entomología, Museo de La Plata, Universidad Nacional de La Plata, Paseo del Bosque s/n, 1900FWA, La Plata, Argentina. CONICET, Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina. E-mail: mlucia@fcnym.unlp.edu.ar*

### Table of contents

Abstract .....	201
Introduction .....	201
Material and methods .....	202
Results .....	204
Systematics .....	204
Genus <i>Xylocopa</i> Latreille, 1802 .....	204
Subgenus <i>Neoxylocopa</i> Michener, 1954 .....	204
Key to species of the <i>Xylocopa</i> ( <i>Neoxylocopa</i> ) present in Argentina .....	204
<i>Xylocopa</i> ( <i>Neoxylocopa</i> ) <i>atamisquensis</i> Lucia & Abrahamovich, 2010 .....	205
<i>Xylocopa</i> ( <i>N.</i> ) <i>augusti</i> Lepeletier, 1841 .....	208
<i>Xylocopa</i> ( <i>N.</i> ) <i>eximia</i> Pérez, 1901 .....	212
<i>Xylocopa</i> ( <i>N.</i> ) <i>frontalis</i> (Olivier, 1789) .....	216
<i>Xylocopa</i> ( <i>N.</i> ) <i>mendozaana</i> Enderlein, 1913 .....	220
<i>Xylocopa</i> ( <i>N.</i> ) <i>nigrocincta</i> Smith, 1854 .....	222
<i>Xylocopa</i> ( <i>N.</i> ) <i>tacanensis</i> Moure, 1949 .....	225
Biological notes .....	230
Discusion .....	235
Acknowledgements .....	235
References .....	236

### Abstract

A systematic revision of the species of the genus *Xylocopa* subgenus *Neoxylocopa* in Argentina is provided. Seven species are included: *X. atamisquensis* Lucia & Abrahamovich, *X. augusti* Lepeletier, *X. eximia* Pérez, *X. frontalis* (Olivier), *X. mendozaana* Enderlein, *X. nigrocincta* Smith and *X. tacanensis* Moure. The males of *X. eximia* and *X. nigrocincta* are described for the first time. *Xylocopa jujuyensis* Brèthes is a new junior synonym of *X. nigrocincta*. Photographs, occurrence maps, and identification keys for the species are presented. Information on the nest architecture and substratum preference are also given.

**Key words:** Anthophila, nesting behavior, pollinators, South America, taxonomy

### Introduction

The subfamily Xylocopinae (Apidae) includes four tribes: Ceratinini, Manuelini, Allodapini and Xylocopini; the latter consists of a single genus, *Xylocopa* Latreille, which are commonly known as carpenter bees because they usually nest within dead wood, except for the subgenus *Xylocopa* (*Proxylocopa*) that nest in the ground (Hurd & Moure 1963). Frequently, the substrate is dead wood, hollow stems of plants and structural timbers of construction (Hurd & Moure 1963; Camillo & Garófalo 1982; Camillo *et al.* 1986; Caicedo *et al.* 1995); however, some species

## References

- Abrahamovich, A.H. & Girarde, S.B. (1991) Selectividad polínica de dos especies de abejas solitarias del género *Xylocopa* en Argentina (Hymenoptera: Anthophoridae). *Turrialba*, 41, 275–278.
- Ascher, J.S. & Pickering, J. (2011) Discover Life bee species guide and world checklist (Hymenoptera: Apoidea: Anthophila). Available from: [http://www.discoverlife.org/mp/20q?guide=Apoidea\\_species](http://www.discoverlife.org/mp/20q?guide=Apoidea_species) (accessed 11 December 2013)
- Bernardino, A.S. & Gaglianone, M.C. (2008) Nest distribution and nesting habits of *Xylocopa ordinaria* Smith (Hymenoptera, Apidae) in a restinga area in the northern Rio de Janeiro State, Brazil. *Revista Brasileira de Entomologia*, 52 (3), 434–440. <http://dx.doi.org/10.1590/s0085-56262008000300017>
- Brèthes, J. (1916) Le genre “*Xylocopa*” Latreille dans la République Argentine. *Physis*, 2, 407–421.
- Cabrera, A.L. & Willink, A. (1973) *Biogeografía de América. Monografía 13. Serie de Biología. Secretaria General de la Organización de los Estados Americanos*. EEUU, Washington DC, 120 pp.
- Caicedo, G.R., Vargas, G.H.A. & Fernández, F. (1995) Fauna asociada con los nidos de las especies carpinteras *Xylocopa* spp. (Hymenoptera: Anthophoridae). *Revista Colombiana de Entomología*, 21, 83–86.
- Camillo, E. & Garófalo, C.A. (1982) On the bionomics of *Xylocopa frontalis* (Olivier) and *Xylocopa grisescens* (Lepeletier) in Southern Brazil. I. Nest construction and biological cycle. *Revista Brasileira de Biología*, 42, 571–582.
- Camillo, E., Garófalo, C.A. & Muccillo, G. (1986) On the bionomics of *Xylocopa suspecta* (Moure) in southern Brazil: nest construction and biological cycle (Hymenoptera, Anthophoridae). *Revista Brasileira de Biología*, 46, 383–393.
- Casolari, C. & Casolari, R.M. (1980) Catalogo della collezione imenotterologica di Massimiliano Spinola 1ª parte. *Bollettino del Museo di Zoologia dell'Università di Torino*, 1, 1–166.
- Cockerell, T.D.A. (1911) Descriptions and records of bees XXXVIII. *Annals and Magazine of Natural History*, 8 (8), 282–290. <http://dx.doi.org/10.1080/00222931108693031>
- Cockerell, T.D.A. (1926) Descriptions and records of bees. CXI. *Annals and Magazine of Natural History*, 17, 657–665. <http://dx.doi.org/10.1080/00222932608633464>
- Cockerell, T.D.A. (1949) Bees from Central America, principally Honduras. *Proceedings of the United States National Museum*, 98, 429–490. <http://dx.doi.org/10.5479/si.00963801.98-3233.429>
- Dalla Torre, C.G. (1896) *Catalogus Hymenopterorum hucusque descriptorum systematicus et synonymicus. Vol. 10.* Guilelmi Engelmann, Lipsiae, pp 643.
- Dusmet & Alonso, J.M. (1924) Las “*Xylocopa*” (Hymen. Apidae) en las colecciones de Madrid. *Trabajos del Museo Nacional de Ciencias Naturales de Madrid*, 49, 5–58.
- Enderlein, G. (1913a) Ein hervorragender Zwitter von *Xylocopa mendozana* aus Argentinien. *Stettiner Entomologische Zeitung*, 74, 124–140.
- Enderlein, G. (1913b) Zur Kenntnis der *Xylocopen* Südamerikas und übereinen Zwitter von *Xylocopa ordinaria*. *Archiv für Naturgeschichte, Abteilung A*, 79, 156–170.
- Fabricius, J.C. (1804) *Systema Piezatorum secundum ordines, genera, species, adjectis synonymis, locis, observationibus, descriptionibus*. Reichard, Brunsvigae, 439 pp.
- Gerling, D.W., Velthuis, H.D. & Hefetz, A. (1989) Bionomics of the large carpenter bee of the genus *Xylocopa*. *Annual Review of Entomology*, 34, 163–190. <http://dx.doi.org/10.1146/annurev.en.34.010189.001115>
- Gonzalez, V.H. & Gonzalez, M.M. (2009) Notas biológicas y taxonómicas sobre los abejorros del Maracuyá del género *Xylocopa* (Hymenoptera: Apidae, Xylocopini) en Colombia. *Acta biológica Colombiana*, 14, 31–40
- Hadley, A. (2011) CombineZP - Free image stacking software for depth of field correction. Available from: <http://www.hadleyweb.pwp.blueyonder.co.uk/CZM/combinezm.htm> (accessed 21 September 2011)
- Hurd, P.D. Jr. & Moure, J.S. (1961) Systematics of the carpenter bee types (genus *Xylocopa* Latreille) contained in the collections of the Museo Argentino de Ciencias Naturales “Bernardino Rivadavia (Hymenoptera: Apoidea). *Journal of the Kansas Entomological Society*, 34, 181–195.
- Hurd, P.D. Jr. & Moure, J.S. (1963) A classification on the large carpenter bees (Xylocopini) (Hymenoptera: Apoidea). *University of California Publications in Entomology*, 29, 1–365. <http://dx.doi.org/10.1086/404488>
- Hurd, P.D. Jr. (1958) Observations on the nesting habits of some new world carpenter bees with remarks on their importance in the problem of species formation. *Annals of the Entomological Society of America*, 51, 365–375.
- Hurd, P.D. Jr. (1978a) *An Annotated Catalog of the Carpenter Bees (Genus Xylocopa Latreille) of the Western Hemisphere (Hymenoptera: Anthophoridae)*. Smithsonian Institution Press, Washington, 106 pp.
- Janvier, H. (1955) Le nid et la nidification chez quelques abeilles des andes tropicales. *Annales des Sciences Naturelles Zoologie et Biologie Animal*, 17, 311–349.
- Jörgensen, P. (1909) Beobachtungen über Blumenbesuch, Biologie, Verbreitung usw. Der Bienen von Mendoza. (Hym.) Teil I. *Deutsche Entomologische Zeitschrift*, 53–65.
- Jörgensen, P. (1912) Revision der Apiden der Provinz Mendoza, Republica Argentina (Hym.). *Zoologische Jahrbücher. Abteilung für Systematik, Geographie und Biologie der Tiere*, 32, 89–162.
- Latreille, P.A. (1802a) *Histoire naturelle, generale et particuliere des crustaces et des insectes. Vol. 3.* F. Dufart, Paris, 467 pp.

- Latreille, P.A. (1802b) Histoire Naturelle des Fourmis, etrecueil de mémoires et d'observations sur les abeilles, les araignées, les faucheurs, et autres insectes. Paris, 445 pp.
- Lepelletier, A.L.M. (1841) *Histoire Naturelle des Insectes. Vol. 2. Hyménoptères*. Roret, Paris, 680 pp.
- Linnaeus, C. (1767) *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio Duodecima, reformata, Pars II. [1766]. Salvii. Holmiae*, pp. 533–1327.
- Lucia, M. & Abrahamovich, A.H. (2010) A new species of large carpenter bee, *Xylocopa* (Hymenoptera: Apidae), from Argentina. *Entomological News*, 121, 243–248.  
<http://dx.doi.org/10.3157/021.121.0305>
- Lucia, M. (2011) *Estudio biosistemático de las abejas de la tribu Xylocopini (Hymenoptera: Apidae) de interés agronómico en Argentina*. Tesis doctoral, 243 pp.
- Marchi, P. & Melo, G.A.R. (2010) Biologia de nidificação de *Xylocopa (Neoxylocopa) frontalis* (Olivier) (Hymenoptera, Apidae, Xylocopini) em Morretes, Paraná. *Oecologia Australis*, 14, 210–231.  
<http://dx.doi.org/10.4257/oeco.2010.1401.12>
- Meunier, F. (1890) Observations sur quelques apides d' Ecuador. *Jornal de Ciencias Mathematicas, Physicas e Naturaes*, (2), 2 (5), 63–65
- Michener, C.D. (1997) Genus-group name of bees and supplemental family group name. *Scientific papers, Natural History Museum, University of Kansas*, 1, 1–81.
- Michener, C.D. (1990) Castes in Xylocopinae bees. In: Engels, W. (Ed.), *Social insects – an evolutionary approach to castes and reproduction*. Springer-Verlag, Berlin, pp. 123–146.
- Michener, C.D. (1954) Bees of Panamá. *Bulletin of the American Museum of Natural History*, 104, 1–175.
- Michener, C.D. (2007) *The bees of the world*. The Johns Hopkins University Press, Baltimore, London, 913 pp.
- Minckley, R.L. (1998) A cladistic analysis and classification of the subgenera and genera of the large carpenter bees, tribe Xylocopini (Hymenoptera: Apidae). *Scientific Papers. Natural History Museum. The University of Kansas*, 9, 1–47.
- Montalva, J., Allendes, J.L. & Lucia, M. (2013) The large carpenter bee *Xylocopa augusti* (Hymenoptera: Apidae): new record to Chile. *Journal of Mellitology*, 12, 1–6
- Moure, J.S. (1947) Notas sobre algunas abejas de la Provincia de Salta. *Revista de la Sociedad Entomológica Argentina*, 13, 218–253.
- Moure, J.S. (1949) Notas sobre algunas abelhas de Tacanas, Tucumán, Argentina II. *Revista de Entomologia, (Rio de Janeiro)*, 19, 337–360.
- Moure, J.S. (2008) Xylocopini Latreille, 1802. In: Moure, J.S., Urban, D. & Melo, G.A.R. (Eds), *Catalogue of Bees (Hymenoptera, Apoidea) in the Neotropical Region*. [Online version. Available from: <http://www.moure.cria.org.br/catalogue> (accessed 11 December 2013)]
- Oliveira Filho, J.H. & Freitas, B.M. (2003) Ninhos racionais para mamangava (*Xylocopa frontalis*) na polinização do maracujá-amarelo (*Passiflora edulis*). *Ciencia Rural*, 33, 1135–1139.  
<http://dx.doi.org/10.1590/s0103-84782003000600021>
- Olivier, G.A. (1789) Histoire Naturelle, Insectes: Abeille. In: Olivier, G.A. (Ed.), *Encyclopédie méthodique, ou par ordre de matières; par une société de gens de lettres, de savans et d'artistes*. Panckoucke, Paris & Liège, pp. 1–331.
- Pereira, M. & Garófalo, C.A. (2010) Biologia da Nidificação de *Xylocopa frontalis* e *Xylocopa griseescens* (Hymenoptera, Apidae, Xylocopini) em ninhos-armadilha. *Oecologia Australis*, 14, 193–209.  
<http://dx.doi.org/10.4257/oeco.2010.1401.11>
- Pérez, J. (1901) Contribution à l'étude des Xylocopes. *Actes de la Société Linnéenne de Bordeaux*, 56, 1–128.
- Prance, G.T. (1976) The pollination and androphore structure of some Amazonian Lecythidaceae. *Biotropica*, 8, 235–241  
<http://dx.doi.org/10.2307/2989715>
- Ramalho, M., Batista, M.A. & Silva, M.M. (2004) *Xylocopa (Monoxylocopa) abbreviata* Hurd & Moure (Hymenoptera: Apidae) e *Encholirium spectabile* (Bromeliaceae): uma associação estreita no semi-árido do Brasil tropical. *Neotropical Entomology*, 33, 417–425.  
<http://dx.doi.org/10.1590/s1519-566x2004000400004>
- Sadeh, A., Shmida, A. & Keasar, T. (2007) The carpenter bee *Xylocopa pubescens* as an agricultural pollinator in greenhouses. *Apidologie*, 38, 508–517.
- Sakagami, S.F. & Laroca, S. (1971) Observations on the bionomics of some Neotropical Xylocopini bees, with some comparative biofaunistic notes (Hymenoptera, Anthophoridae). *Journal of the Faculty of Science, Hokkaido Imperial University, Zool.*, 18, 57–127.
- Schrottky, C. (1904) Beitrag zur Kenntnis einiger südamerikanischer Hymenopteren. *Allgemeine Zeitschrift für Entomologie*, 9, 344–349.
- Smith, F. (1854) *Catalogue of Hymenopterous Insects in the Collection of the British Museum. Part II. Apidae*. British Museum, London, 199–465 pp.
- Smith, F. (1874) Monograph of the genus *Xylocopa*, Latr. *Transactions of the American Entomological Society*, 1874, 247–307.  
<http://dx.doi.org/10.1111/j.1365-2311.1874.tb00168.x>
- Strand, E. (1912) Beiträge zur Kenntnis der Hymenopterenfauna von Paraguay auf Grund der Sammlungen und Beobachtungen von Prof. J. D. Anisits. *Zoologische Jahrbücher. Abteilung für Systematik, Geographie und Biologie der Tiere*, 33, 257–346.

- Tellería, M.C. (1999) Pollen collected by *Xylocopa augusti* (Hymenoptera, Apidae) in the northwestern of the Buenos Aires province, Argentina. *Darwiniana*, 37, 253–258.
- Urban, D. (2003) Catálogo das abelhas publicadas por Jesus Santiago Moure. In: Melo, G.A.R. & Alves-dos-Santos, I. (Eds.), *Apoidea Neotropica: Homenagem aos 90 anos de Jesus Santiago Moure*. UNESC, Criciúma, pp, 11–43.
- Viana, B.F., Kleinert, A.M.P. & Silva, F.O. (2002) Ecologia de *Xylocopa* (*Neoxylocopa*) *cearensis* (Hymenoptera, Anthophoridae) nas dunas litorâneas de Abaeté, Salvador, Bahia. *Iheringia série Zoologia*, 92, 47–57.  
<http://dx.doi.org/10.1590/s0073-47212002000400007>
- Villers, C. (1789) *Caroli Linnaei Entomologia, faunae Suecicae descriptionibus aucta. Vol.3*. Lugduni, 657 pp.
- Zanella, F.C.V. & Silva, M. (2010) Uma nova espécie de *Xylocopa* (*Monoxylocopa*) Hurd & Moure e novos registros de *X. abbreviata* Hurd & Moure (Hymenoptera: Apidae). *Neotropical Entomology*, 39 (1), 61–66.  
<http://dx.doi.org/10.1590/s1519-566x2010000100009>