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Diversity and distribution of the insect subgenus Nodita

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Abstract

The type localities, ditribution records, available DNA sequence numbers of Nodita species are provided in the study. Statistical analysis is conducted based on these data and the result shows that: (1) Cuba, Guatemala and Brazil have the most type localities for species in the Caribben, North and Central America, and South America respectively; (2) The highest diversity is in South Ameica. For countries, Cuba, Costa Rica and Brazil have the highest diversity. (3) various countries lack the distribution data. A discussion on the result of this study is also presented.

Keywords

Type localities, distribution records, DNA sequence numbers, statistical analysis, highest diversity.

1. Introduction

The subgenus *Nodita* was described independently by Navás [1] and it was treated as a subgenus of *Leucochrysa* (*s. l.*) by Brooks and Barnard [2]. It includes 143 species and one subspecies, distributing in the Caribbean, Nothern and Central America and South America. At present, it is not well-known and not fully summarized how the species occur in their regions. Therefore, a study with currently valid species name of *Nodita* to know how diverse it is will be important for professional researches and amateur entomologist. The purpose of this study is to provide the valid name with key information on the species, containg type localities, distribution records and available DNA sequence numbers. Using these data, the diversity and occurrence of members of this subgenus in each region and each country are analyzed to exhibit areas where the subgenus was well studied compared to areas with missing data.

2. Materials and methods

Valid species names of the subgenus were retrieved from Oswald [3], which forming the basis of this study. Related Literature was also gained the online digital library established by Oswald [3]. Information on type localities and distribution data was obtained from the collected literature and sequence accession numbers were acquired from NCBI. All these data were summarized in Tables 1-2 and were used for statistical analysis to explore the regional diversity. Central America and North America were treated as a whole and Panama was included in Central America and North America in this study.

3. Results

3.1. Literature

In the study, 104 articles were studied for information on the 143 *Nodita* species and one subspecies legitimate (Table 1). Papers published on *Nodita* species have decreased obviously

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in recent decades. The number of professional taxonomist and the interest of taxonomy have been visibly decreased, which may be the main reason.

3.2. Type localities (Table 1)

In the Caribbean, Cuba has 11 type localities for species from out of the 143 species, two are from Dominican Republic and two are from Jamaica. In North and Central America, 12 species have been recorded from type localities in Guatemala, 9 are from Costa Rica, 7 are from Mexico, five are from Panama, four are from the United States, and one is from Honduras. In South Ameica, Brazil has 54 species, Colombia has nine species, Suriname has six species, Ecuador has five species, Peru has four species, Paraguay has three species, venezuela has three species, Bolivia has two species, French Guiana has two species, and Guyana has two species described from their type localities.

3.3. Distribution and diversity

The highest known species diversity of *Nodita* is in South America with 95 species. This is followed by North and Central Ameica with 62 species, and the Caribbean with18 species. (Table 2)

Some species are widely distributed, while other species probably have a restricted distribution and are known from one or a few countries (Table 1). Thirteen species of *Nodita* occur on two or more regions of the continent. These examples are *L. amazonica*, *L. azevedoi*, *L. caucella*, *L. cornesta*, *L. cortesi*, *L. egregia*, *L. gossei*, *L. lancala lancala*, *L. lateralis*, *L. lenora*, *L. maronica*, *L. nigrovaria*, *L. postica* (Table 2).

Table 1. Records of *Nodita* species throughout the world.

No.	Species	Synonym	Type locality	Distribution	Available DNA sequence accession numbers
1	*L. (N.) affinis* de Freitas & Penny, 2001	-	Brazil (Jaboticabal) [4]	Brazil [3, 4]	-
2	*L. (N.) aleura* (Banks, 1944)	-	Suriname (Paramaribo) [5]	Suriname [3, 5, 6]	-
3	*L. (N.) alloneura* (Banks, 1946)	-	Panama (Barro Colorado) [7]	Mexico [3, 8]; Panama [3, 6, 7]	-
4	*L. (N.) alternata* Navás, 1913	-	Mexico (Atoyac) [9]	Mexico [3, 9]; Costa Rica [3]	-
5	*L. (N.) amazonica* Navás, 1913	-	Brazil (Lower Amazon) [10]	Brazil [3, 6, 9, 10, 11, 12]; Costa Rica [3, 11]; El Salvador [3, 11, 12], Honduras [3, 11, 12]; Panama [3, 11, 12]; Guyana [3, 5, 6, 11, 12]	-
6	*L. (N.) americana* Banks, 1897	*L. (N.) antennata* Banks, 1905; Mexico (Tuxpen) [14]; Tauber [15] synonymized it with *L. americana*. *N. nigrinervis* Banks, 1939; United States (McKinley) [16]; Tauber [15] synonymized it with *L. americana*. *N. texana* Banks, 1939; United States (Travis) [16];Tauber [15] synonymized it with *L. americana*. *Erenochryza rufina* Banks, 1950; United States (Grand Canyon) [17]; Tauber [15] synonymized it with *L. americana*.	United States (Auburn) [13]	Mexico [3, 6, 7, 8, 14, 15, 17, 18, 19, 20]; United States [3, 13, 15, 16, 18, 19, 21, 22, 23]	DQ414478.1 (CAD); DQ414502.1 (COI); DQ399279.1 (16S rRNA) (numbers belong to *N. texana* (= *L. americana*))
7	*L. (N.) amistadensis* Penny, 2001	-	Costa Rica (Puntarena) [24]	Costa Rica [3, 11, 24]	-
8	*L. (N.) anae* de Freitas, 2007	-	Brazil (Vitoria da Conquista) [25]	Brazil [3, 25]	-
9	*L. (N.) anchietai* (Navás, 1922)	-	Brazil ("Tres Rios, Jacarépagúa") [26]	Brazil [3, 6, 26]	-
10	*L. (N.) antennalis* (Navás, 1932)	-	Ecuador (Rio Perpa) [27]	Cuba [3]; Ecuador [3, 27, 28]; Mexico [3, 6]	-
11	*L. (N.) antica* Navás, 1913	-	Guatemala (Panzós) [9]	Costa Rica [3, 11]; Guatemala [3, 9]	-
12	*L. (N.) apicalis* Banks, 1915	-	Peru (Rio Pacaya) [29]	Peru [3, 6, 29]	-
13	*L. (N.) apicata* (Navás, 1926)	-	Brazil ("Nictheroy" [= Niterói] [30]) [3]	Brazil [3, 6, 30]	-
14	*L. (N.) askanes* (Banks, 1946)	-	Guatemala (Maco) and Honduras (Subirana) [7]	Costa Rica [3, 11]; Guatemala [3, 6, 7]; Honduras [3, 6, 7]; Mexico [3, 19]	-
15	*L. (N.) australis** (Navás, 1917a) (nomen nudum) [31]	-	-	-	-
16	*L. (N.) azevedoi* Navás, 1913	-	Brazil (Campos dos Goytacazes) [32]	Brazil [3, 6, 9, 10, 32, 33, 34, 35, 36]; Costa Rica [32, 37]; Peru [38]	-
17	*L. (N.) barrei* de Freitas & Penny, 2001	-	Brazil (Iriquira) [4]	Brazil [3, 4]	-
18	*L. (N.) callota* Banks, 1915	-	United States (Austin) [29]	Mexico [3, 15, 19, 41]; United States [3, 14, 18, 23, 29, 39, 40, 41, 42]	-
19	*L. (N.) camposi* (Navás, 1933)	-	Ecuador (Guayaquil) [32, 43]	Brazil [4]; Ecuador [3, 6, 32, 43, 44]	KY039011.1 (COI); KY039044.1 (16S rRNA)
20	*L. (N.) caucella* Banks, 1910	-	Colombia ("Inmba" [= Yumbo] [3]) [45]	Colombia [3, 5, 7, 10, 11, 45]; Panama [3, 7, 11]; Venezula [3, 5, 11]	-
21	*L. (N.) centralis* Navás, 1913	-	Panama (Chiriqui) [10]	Panama [3, 10]	-
22	*L. (N.) cerverai* (Navás, 1922)	-	Cuba ("La Habana" [= Havana] [3]) [26]	Cuba [3, 6, 28, 46, 47]; Cayman Island [3, 6, 48]	-

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No.	Species	Synonym	Type locality	Distribution	Available DNA sequence accession numbers
23	*L. (N.) championi* Navás, 1914	-	Guatemala (Zapote) [49]	Guatemala [3, 49]; Panama [3, 5, 6]; Venezula [3, 5, 6]	-
24	*L. (N.) cidae* de Freitas, 2007	-	Brazil (Vitoria da Conquista) [25]	Brazil [3, 25]	-
25	*L. (N.) clepsydra* Banks, 1918	-	Colombia ("Inmbo" [?= Yumbo] [3]) [50, 51]	Brazil [3, 4]; Colombia [3, 4, 5, 50, 51]	-
26	*L. (N.) clystera* Banks, 1918	-	Colombia (San Antonio) [50]	Colombia [3, 5, 6, 50]	-
27	*L. (N.) compar* (Navás, 1921)	*Nodita loyolana* Navás 1925; Cuba (Santiago de las Vegas) [46]; Alayo [47] synonymized it with L. compar.	Cuba ("Habana" [= Havana] [3]) [52]	Cuba [3, 6, 11, 46, 47, 52, 53]; Costa Rica [3, 11]	-
28	*L. (N.) confusa* de Freitas & Penny, 2001	-	Brazil (Fraiburgo) [4]	Brazil [3, 4]	-
29	*L. (N.) cornesta* (Banks, 1944)	-	French Guiana (Godeberi-Maroni) and Surinam (Teniomarien) [5]	Costa Rica [3, 11]; French Guiana [3, 5, 6, 11]; Suriname [3, 5, 6, 11]	-
30	*L. (N.) cornuta* de Freitas & Penny, 2001	-	Brazil (Guaira) [4]	Brazil [3, 4]	-
31	*L. (N.) cortesi* Navás, 1913	*L. calverti* Banks, 1914a; Costa Rica (Banana Riv. District) [54]; Banks [7] synonymized it with *L. cortesi*.	Mexico (Teapa) [9]	Costa Rica [3, 5, 6, 7, 11, 54]; Mexico [3, 9, 11]; Panama [3, 7]; Trinidad and Tobago [3, 6, 11]; Venezula [3, 6, 11]	-
32	*L. (N.) cruentata* (Schneider, 1851)	-	Brazil (Schneider 1851) [55]	Brazil [3, 4, 6, 10, 55, 56, 57]; French Guiana [3, 5, 6]; Suriname [3, 5, 6]; Venezula [3, 5, 6]	KY039015.1 (COI); KX099401.1 (COI); KY039048.1 (16S rRNA); KX099546.1 (16S rRNA).
33	*L. (N.) deminuta* Lacroix, 1926	-	Brazil (Uberaba) [58, 59]	Brazil [3, 6, 58, 59]	-
34	*L. (N.) diasi* (Navás, 1922)	-	Brazil (Baturité) [60]	Brazil [3, 6, 60]	-
35	*L. (N.) digitiformis* C. Tauber et al., 2008	-	Brazil (Campos dos Goytacazes) [51]	Brazil [3, 51]	-
36	*L. (N.) dimidia* (Navás, 1925)	-	Cuba (Santiago de Vegas) [46]	Cuba [3, 6, 46, 47, 61]	-
37	*L. (N.) diversa* (Walker, 1853)	-	Countries unknown [3, 56, 57] (probably South or Central America [3])	Unknown	-
38	*L. (N.) egregia* Navás, 1913	*L. luctuosa* Banks, 1914b; Costa Rica (Orosi) [62]; Penny [11] synonymized it with *L. egregia*.	Guatemala (Atitlan) [9]	Bolivia [3]; Costa Rica [3, 6, 11, 37, 62]; Guatemala [3, 9, 11, 61]; Panama [23, 81, 84, 87]	-
39	*L. (N.) eubule* (Banks, 1944)	-	Colombia (Rio Frio) [22]	Colombia [22, 81, 84]	-
40	*L. (N.) euterpe* (Banks, 1944)	-	Suriname (Paramaribo) [5]	Suriname [3, 5, 6]	-
41	*L. (N.) explorata* (Hagen, 1861)	*N. oenops* Adams, 1987; Nicaragua (Leon) [12]; Tauber [15] synonymized it with *L. explorara*.	Mexico (Palitla) [63]	Costa Rica [3, 11, 12, 15]; Mexico [3, 15, 24, 57, 63]; Nicaragua [3, 11, 12, 15]; United States [3, 15, 18, 21, 24, 64]	-
42	*L. (N.) firmini* (Navás, 1924)	-	Cuba (Santiago de las vegas) [65]	Cuba [3, 6, 47, 65]	-
43	*L. (N.) firmini* (Navás, 1927)	-	Cuba ("La Habana" [= Havana] [3]) [66]	Cuba [3, 47, 66]	-
44	*L. (N.) floridana* Banks, 1897	*L. haitiensis* R. C. Smith, 1931; Haiti (Port-au-Prince [near Damien] [3]) [69]; Tauber [15] synonymized it with *L. floridana*.	United States (Lake Worth) [67]	Bahamas [3]; Dominican Republic [3, 15]; Haiti [3, 6, 15]; Mexico [3, 15]; United States [3, 5, 21, 24, 41, 42, 67, 68]	-
45	*L. (N.) forciformis* de Freitas & Penny, 2001	-	Brazil (Itiquira) [4]	Brazil [3, 4]	KY039025.1 (COI); KY039057.1 (16S rRNA)
46	*L. (N.) forcipata* Penny, 1998	-	Costa Rica (Río Tabarcia) [70]	Costa Rica [3, 11, 70]	-

No.	Species	Synonym	Type locality	Distribution	Available DNA sequence accession numbers
47	*L. (N.) furcata* de Freitas & Penny, 2001	-	Brazil (Itiquira) [4]	Brazil [3, 4, 11]	-
48	*L. (N.) fuscinervis* Navás, 1914	-	Guatemala ("Amula" [= Almolonga] [3]) [49]	Guatemala [3, 49]	-
49	*L. (N.) garridoi* (Alayo, 1968)	-	Cuba (Pica Pica) [47]	Cuba [3, 6, 47]	-
50	*L. (N.) gemina* (Navás, 1929)	-	Brazil (Joinville) [35]	Brazil [3, 6, 35]	-
51	*L. (N.) gloriosa* (Banks, 1910)	-	Colombia (Cañon del Tolima) [45]	Colombia [3, 5, 6, 10, 45]	-
52	*L. (N.) gossei* (Kimmins, 1940)	*Chrysopa conformis* Walker, 1853; Kimmins [71] proposed the new name to replace *C. conformis* Walker, 1853, which is a junior homonym of *C. conformis* Rauber, 1842.	Jamaica (Walker 1853) [56]	Brazil [3, 4]; Cuba [57, 63] Jamaica [3, 56, 57, 63]; Mexico [63]; United States [63]	KY039016.1 (COI); KY039049.1 (16S rRNA)
53	*L. (N.) grisoli* (Navás, 1912)	-	Venezula (Arismende) [72]	Venezula [3, 6, 10, 72, 73]	-
54	*L. (N.) guataparensis* de Freitas & Penny, 2001	-	Brazil (Luís Antônio) [4]	Brazil [3, 4]	-
55	*L. (N.) heriocles* (Banks, 1944)	-	Guyana (Bartica) and Suriname (Kuakoegron and Paramaribo) [5]	Brazil [3, 4]; Guyana [3, 5, 6]; Suriname [3, 4, 5, 6]	-
56	*L. (N.) horni* (Navás, 1932)	-	Brazil (Santa Thereza) [74]	Brazil [3, 6, 74]	-
57	*L. (N.) hybrida* (Rambur, 1842)	-	Countries unknown [75]	Brazil [3, 6, 10, 55, 56, 57, 76, 77]	-
58	*L. (N.) icterica* de Freitas & Penny, 2001	-	Brazil (Birigui) [4]	Brazil [3, 4]	KY039022.1 (COI); KY039055.1 (16S rRNA)
59	*L. (N.) incognita* de Freitas & Penny, 2001	-	Brazil (Itiquira) [4]	Brazil [3, 4]	-
60	*L. (N.) indiga* (Navás, 1928)	-	Costa Rica (Alajuela) [37]	Costa Rica [3, 6, 11, 24, 37]	-
61	*L. (N.) inquinata* Gerstaecker, 1888	-	Peru (Cumbase, Saracayon) [78]	Peru [3, 6, 10, 78]	-
62	*L. (N.) interata* de Freitas & Penny, 2001	-	Brazil (Jaboticabal) [4]	Brazil [3, 4]	-
63	*L. (N.) intermedia* (Schneider, 1851)	-	Brazil [55]	Brazil [3, 4, 6, 9, 10, 55, 56, 57]	-
64	*L. (N.) israeli* (Alayo, 1968)	-	Cuba (Yateras, Cupeyal) [47]	Cuba [3, 6, 47]	-
65	*L. (N.) kotzbaueri* (Navás, 1926)	-	Brazil ("Nictheroy" [= Niterói] [3]) [30]	Brazil [3, 6, 30]	-
66	*L. (N.) laertes* (Banks, 1946)	-	Panama (Juan Mina) [7]	Costa Rica [3, 11]; Panama [3, 7, 11]	-
67	*L. (N.) lafoni* (Navás, 1911)	-	Costa Rica [79]	Costa Rica [3, 6, 11, 73, 79]	-
68	*L. (N.) lancala lancala* (Banks, 1944)	-	Colombia (Rio Frio) [5]	Brazil [3, 4, 5]; Costa Rica [3, 11]; Colombia [3, 5, 6, 11]; Panama [3, 11]; Suriname [3, 5, 6, 11]; Venezula [3, 11]	KY039024.1 (COI); DQ414503.1 (COI); DQ414479.1 (CAD); DQ399277.1 (16S rRNA)
69	*L. (N.) lancala plenota* (Banks, 1944)	-	Suriname (Paramaribo) [5]	Suriname [3, 5]	-
70	*L. (N.) lateralis* Navás, 1913	-	Guatemala (Atitlán) [9]	Brazil [3, 4]; Guatemala [3, 9]	-
71	*L. (N.) lenora* (Banks, 1944)	-	Suriname (Paramaribo) [5]	Brazil [3, 5, 6, 11]; Costa Rica [3, 11]; Suriname [3, 5, 6, 11]; Venezula [3, 5, 6, 11]	-

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72	*L. (N.) lineata* de Freitas & Penny, 2001	-	Brazil (Luis Antônio) [4]	Brazil [3, 4]	KY039018.1 (COI); KY039051.1 (16S rRNA)
73	*L. (N.) longistigma* (Navás, 1930)	-	Ecuador (Guayaquil) [36]	Ecuador [3, 6, 36]	-
74	*L. (N.) maculosa* de Freitas & Penny, 2001	-	Brazil (Taquaritinga) [4]	Brazil [3, 4]	-
75	*L. (N.) mainerina* (Navás, 1929)	-	Peru (Amazones) [80]	Peru [3, 6, 28, 80, 81]	-
76	*L. (N.) marginalis* Banks, 1915	-	Bolivia ("Rio Longo" [= Zongo Riv.] [3]) [29]	Bolivia [3, 4, 5, 6, 29]; Brazil [4]; Colombia [3, 6]	-
77	*L. (N.) maronica* Navás, 1915	-	French Guiana (Maroni) [82]	French Guiana [3, 6, 7, 82]; Guyana [3, 5]; Panama [3]; Suriname [3, 5]; Venezula [3, 5]	-
78	*L. (N.) marquezi* Navás, 1913	-	Paraguay (San Bernardino) [10]	Brazil [3, 4]; Paraguay [3, 6, 10]	KY039023.1 (COI); DQ414498.1 (COI); KY039056.1 (16S rRNA); DQ399280.1 (16S rRNA); DQ414476.1 (CAD)
79	*L. (N.) melanocera* (Navás, 1916)	-	Brazil (Bahía) [1]	Brazil [1, 3, 4, 6, 35, 61, 83]	-
80	*L. (N.) meridana* (Navás, 1927)	-	Venezula (Mérida) [33]	Venezula [3, 6, 33]	-
81	*L. (N.) meteorica* Gerstaecker, 1894	-	Bolivia (Rio Juntas) [84]	Bolivia [3, 6, 10, 84]	-
82	*L. (N.) mexicana* Banks, 1900	-	Mexico (Chavarillo) [85]	Honduras [3, 6, 7]; Mexico [3. 6, 7, 19, 85, 86]; Panama [3, 6, 7]	-
83	*L. (N.) michelini* de Freitas & Penny, 2001	-	Brazil (Jaboticabal) [4]	Brazil [3, 4]	KY039021.1 (COI); KY039054.1 (16S rRNA)
84	*L. (N.) minima* Banks, 1918	-	Colombia (Caldras [?= Caldas] [3]) [50]	Colombia [3, 4, 5, 50]	-
85	*L. (N.) montanola* Banks, 1910	-	Colombia (Cañon del Monte Tolima) [45]	Colombia [3, 5, 6, 10, 45]	-
86	*L. (N.) morenoi* (Navás, 1934)	-	Ecuador (Quito) [32, 87]	Ecuador [3, 6, 32, 73, 87]	-
87	*L. (N.) morrisoni* (Navás, 1914)	-	Mexico (Sonora) [49]	Mexico [3, 49]	-
88	*L. (N.) mortoni* Lacroix, 1926	-	Brazil (Uberaba) [58, 59]	Brazil [3, 6, 58, 59]	-
89	*L. (N.) nativa* (Navás, 1911)	-	Costa Rica (Navás 1911) [79]	Costa Rica [3, 6, 11, 73, 79]	-
90	*L. (N.) navasi* (Kimmins, 1940)	*L. altenata* Navás, 1914; Kimmins [71] proposed the new name to replace *L. altenata* Navás, 1914, which is a junior homonym of *L. altenata* Navás, 1913.	Costa Rica (Cache) [49]	Costa Rica [3, 11, 71]; Honduras [3, 7, 11]; Mexico [3, 6, 11, 19, 71]	-
91	*L. (N.) nezites* Navás, 1913	-	Jamaique [= Jamaica] [9]	Jamaica [3, 6, 9]	-
92	*L. (N.) neuralis* Banks, 1910	-	Colombia (San Antonio) [45]	Colombia [3, 5, 6, 10, 45]; Venezula [3, 5, 6]	-
93	*L. (N.) nictheroyana* (Navás, 1926)	-	Brazil ("Nictheroy" [= Niterói] [3]) [30]	Brazil [3, 6, 30]	-
94	*L. (N.) nigrovaria* (Walker, 1853)	*Chrysopa ceratica* Navás, 1911; Costa Rica [79]; Penny [11] synonymized it with *L. nigrovaria*. *N. maculata* Navás, 1928; Costa Rica (San José) [37] Penny [11] synonymized it with *L. nigrovaria*.	Venezula (Walker 1853) [56]	Colombia [3, 5, 6, 11, 88]; Costa Rica [3, 6, 11, 20, 37, 54, 73, 79]; Mexico [3, 8, 20]; Panama [3, 6, 7, 20]; Venezula [3, 6, 9, 10, 11, 56, 57]	-

No.	Species	Synonym	Type locality	Distribution	Available DNA sequence accession numbers
95	*L. (N.) notulata* (Navás, 1924)	-	Unknown Country(ies) unknown (probably Central or South America) [3, 89]	Unknown	-
96	*L. (N.) ocampina* (Banks, 1941)	-	Dominican Republic [90]	Dominican Republicn [3, 6, 90, 91]	-
97	*L. (N.) orthones* (Banks, 1946)	-	Panama (Juan Mina) [7]	Panama [3, 6, 7]	-
98	*L. (N.) pacifica* (Navás, 1929)	-	Ecuador (Guayaquil) [34]	Ecuador [3, 6, 34]	-
99	*L. (N.) palleszens* (Banks, 1946)	-	Guatemala ("San Jose" [= Puerto San Jose] [3]) [7]	Costa Rica [3, 11]; Guatemala [3, 6, 7, 11]	-
100	*L. (N.) panamana* (Banks, 1946)	-	Panama (La Campana and El Cermeno) [7]	Colombia [3, 6]; Panama [3, 6, 7, 92]; Suriname [3, 6]	-
101	*L. (N.) parallela* de Freitas & Penny, 2001	-	Brazil (Jaboticabal) [4]	Brazil [3, 4]	-
102	*L. (N.) paraquaria* (Navás, 1929)	-	Paraguay (San Bernardino) [93]	Paraguay [3, 6, 93]	-
103	*L. (N.) pavida* (Hagen, 1861)	-	United States (South Carolina) [15]	Mexico [3, 15, 18, 19, 23, 63]; United States [3, 5, 18, 23, 39, 40, 41, 63, 94, 95]	-
104	*L. (N.) platyptera* Gerstaecker, 1888	-	Brazil (Blumenau) [78]	Brazil [3, 6, 10, 78]	-
105	*L. (N.) postica* Navás, 1913	-	Guatemala (San Juan) [9]	Costa Rica [3, 11]; French Guiana [3, 5, 6, 11]; Guatemala [3, 9, 61]; Peru [38]; Suriname [3, 5, 6, 11]	LC127048.1 (*ATPase*); LC127034.1 (*wingless*); LC127019.1 (*PepCK*)
106	†*L. (N.) prisca* Engel & Grimaldi, 2007	-	Dominican Republic [96]	Dominican Republic [3, 96, 97]	-
107	*L. (N.) punctata* Banks, 1903	-	Guatemala [98]	Guatemala [3, 6, 7, 98]; Mexico [3, 8]; Panama [3, 6, 7]	-
108	*L. (N.) radiosa* Gerstaecker, 1888	-	Peru ("Cumbase") [78]	Peru [3, 6, 10, 78]	-
109	*L. (N.) ramosa* (Navás, 1917)	-	Guatemala ("Amula" [= Almolonga] [3]) [99]	Guatemala [3, 6, 99]; Panama [3, 6, 7]	-
110	*L. (N.) ramosi* (Navás, 1916)	-	Brazil (Nueva Friburgo) [1]	Brazil [1, 3, 6, 61]	-
111	*L. (N.) ratcliffei* Penny, 2001	-	Costa Rica (Pandora) [24]	Costa Rica [3, 11, 24]	-
112	*L. (N.) retusa* de Freitas & Penny, 2001	-	Brazil (Balsamo) [4]	Brazil [3, 4]	-
113	*L. (N.) robusta* de Freitas & Penny, 2001	-	Brazil (Itiquira) [4]	Brazil [3, 4]	KY039020.1 (COI); DQ414499.1 (COI); KY039053.1 (16S rRNA); DQ399281.1 (16S rRNA); DQ414477.1 (CAD)
114	*L. (N.) rochana* (Navás, 1922)	-	Brazil (Baturité) [60]	Brazil [3, 6, 60]	-
115	*L. (N.) rodriguezi* Navás, 1913	-	Paraguay (San Bernardino) [10]	Brazil [3, 4]; Paraguay [3, 6, 10]	KY039013.1 (COI); KY039046.1 (16S rRNA)
116	*L. (N.) rufescens* (Navás, 1931)	-	Brazil (Santa Cataria) [100]	Brazil [3, 6, 100]	-
117	*L. (N.) salleana* (Navás, 1911)	-	Mexico [79]	Mexico [3, 6, 19, 79]	-
118	*L. (N.) santini* de Freitas & Penny, 2001	-	Brazil (Jaboticabal) [4]	Brazil [3, 4]	KY039012.1 (COI); KY039045.1 (16S rRNA)

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No.	Species	Synonym	Type locality	Distribution	Available DNA sequence accession numbers
119	*L. (N.) scomparini* de Freitas & Penny, 2001	-	Brazil (Itiquira) [4]	Brazil [3, 4, 73]	KY039019.1 (COI); KY039052.1 (16S rRNA)
120	*L. (N.) scurra* Lacroix, 1926	-	Brazil (Uberaba) [58]	Brazil [3, 6, 58, 59]	-
121	*L. (N.) senior* (Navás, 1935)	-	Brazil (Porto Alegre) [101]	Brazil [3, 6, 101]	-
122	*L. (N.) serrai* (Navás, 1924)	-	Costa Rica [102]	Costa Rica [3, 6, 11, 73, 102]; Panama [3, 6, 7]	-
123	*L. (N.) squamisetosa* de Freitas & Penny, 2001	-	Brazil (Birigui) [4]	Brazil [3, 4]	-
124	*L. (N.) stichocera* Navás, 1908	-	Brazil (Nueva Trento) [103]	Brazil [3, 6, 61, 103]	-
125	*L. (N.) stichocera* Navás, 1913	-	Brazil (Nueva Trento) [10]	Brazil [3, 6, 10]	-
126	*L. (N.) submacula* Banks, 1915	-	Guyana (Bartica) [29]	Colombia [3, 5, 6]; Guyana [3, 5, 6, 29]; Suriname [3, 5, 6]	-
127	*L. (N.) sulcata* (Navás, 1921)	-	Mexico (Jalisco, somewhere near Guadalajara) [104]	Mexico [3, 6, 19, 73, 104]	-
128	*L. (N.) superior* Navás, 1913	-	Guatemala (San Geronimo) [9]	Costa Rica [3, 6, 11, 37]; Guatemala [3, 9, 10, 11]	-
129	*L. (N.) surinamensis* (Banks, 1944)	-	Suriname (Waremapan creek) [5]	Suriname [3, 5, 6]	-
130	*L. (N.) tabacina* de Freitas & Penny, 2001	-	Brazil (Itiquira) [4]	Brazil [3, 4]	-
131	*L. (N.) tarini* (Navás, 1924)	-	Cuba (Santiago de las Vegas) [53]	Cuba [3, 6, 47, 53]	-
133	*L. (N.) theodori* (Navás, 1932)	-	Brazil (Porto Alegre) [74]	Brazil [3, 6, 74]	-
134	*L. (N.) theodorina* (Navás, 1935)	-	Brazil (Porto Alegre) [101]	Brazil [3, 6, 101]	-
135	*L. (N.) urucumis* de Freitas, 2007	-	Brazil (Vitoria da Conquista) [25]	Brazil [3, 25]	-
136	*L. (N.) vegana* (Navás, 1925)	-	Cuba (Santiago de las Vegas) [46]	Cuba [3, 6, 46, 47]	-
137	*L. (N.) vieirana* Navás, 1913	-	Brazil (Nueva Friburgo) [10]	Brazil [3, 6, 10, 61]	-
138	*L. (N.) vignizi* de Freitas & Penny, 2001	-	Brazil (Itiquira) [4]	Brazil [3, 4]	-
139	*L. (N.) vinesi* (Navás, 1924)	-	Cuba (Santiago de las Vegas and Camagüey) [53]	Cuba [3, 6, 46, 47, 53, 61]	-
140	*L. (N.) virginiae* Penny, 1998	-	Costa Rica (Limón) [85]	Costa Rica [81, 85, 87]	-
141	*L. (N.) vittata* de Freitas & Penny, 2001	-	Brazil (Ribeirão Preto) [70]	Brazil [3, 11, 70]	-
142	*L. (N.) ypirangana* (Navás, 1932)	-	Brazil ("Ypiranga" [= Ipriranga] [3]) [74]	Brazil [3, 6, 74]	-
143	*L. (N.) zapotina* Navás, 1913	-	Guatemala (Zapote) [9]	Guatemala [3, 9]	-
144	*L. (N.) zayasi* (Alayo, 1968)	-	Cuba (Daiquiri) [47]	Cuba [3, 6, 47]	-

Table 2. Distribution of *Nodita* according to regions and countries.

Region	Species per region	Country	Species per country
Caribbean	*L.* (*N.*) *antennalis* (Navás, 1932)	Bahamas	*L.* (*N.*) *floridana* Banks, 1897
-	*L.* (*N.*) *cerverai* (Navás, 1922)	Cayman Islands	*L.* (*N.*) *cerverai* (Navás, 1922)
-	*L.* (*N.*) *compar* (Navás, 1921)	Cuba	*L.* (*N.*) *antennalis* (Navás, 1932)
-	*L.* (*N.*) *cortesi* Navás, 1913	-	*L.* (*N.*) *cerverai* (Navás, 1922)
-	*L.* (*N.*) *dimidia* (Navás, 1925)	-	*L.* (*N.*) *compar* (Navás, 1921)
-	*L.* (*N.*) *firmini* (Navás, 1924)	-	*L.* (*N.*) *dimidia* (Navás, 1925)
-	*L.* (*N.*) *firmini* (Navás, 1927)	-	*L.* (*N.*) *firmini* (Navás, 1924)
-	*L.* (*N.*) *floridana* Banks, 1897	-	*L.* (*N.*) *firmini* (Navás, 1927)
-	*L.* (*N.*) *garridoi* (Alayo, 1968)	-	*L.* (*N.*) *garridoi* (Alayo, 1968)
-	*L.* (*N.*) *gossei* (Kimmins, 1940)	-	*L.* (*N.*) *gossei* (Kimmins, 1940)
-	*L.* (*N.*) *israeli* (Alayo, 1968)	-	*L.* (*N.*) *israeli* (Alayo, 1968)
-	*L.* (*N.*) *nesites* Navás, 1913	-	*L.* (*N.*) *tarini* (Navás, 1924)
-	*L.* (*N.*) *ocampina* (Banks, 1941)	-	*L.* (*N.*) *vegana* (Navás, 1925)
-	†*L.* (*N.*) *prisca* Engel & Grimaldi, 2007	-	*L.* (*N.*) *vinesi* (Navás, 1924)
-	*L.* (*N.*) *tarini* (Navás, 1924)	-	*L.* (*N.*) *zayasi* (Alayo, 1968)
-	*L.* (*N.*) *vegana* (Navás, 1925)	Dominican Republic	*L.* (*N.*) *floridana* Banks, 1897
-	*L.* (*N.*) *vinesi* (Navás, 1924)	-	*L.* (*N.*) *ocampina* (Banks, 1941)

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Region	Species per region	Country	Species per country
-	*L.* (*N.*) *zayasi* (Alayo, 1968)	-	*L.* (*N.*) *prisca* Engel & Grimaldi, 2007
-	-	Haiti	*L.* (*N.*) *floridana* Banks, 1897
-	-	Jamaica	*L.* (*N.*) *gossei* (Kimmins, 1940)
-	-	-	*L.* (*N.*) *nesites* Navás, 1913
-	-	Trinidad and Tobago	*L.* (*N.*) *cortesi* Navás, 1913
-	-	United States Virgin Islands	*L.* (*N.*) *gossei* (Kimmins, 1940)
North and Central America	*L.* (*N.*) *alloneura* (Banks, 1946)	Costa Rica	*L.* (*N.*) *alternata* Navás, 1913
-	*L.* (*N.*) *alternata* Navás, 1913	-	*L.* (*N.*) *amazonica* Navás, 1913
-	*L.* (*N.*) *amazonica* Navás, 1913	-	*L.* (*N.*) *amistadensis* Penny, 2001
-	*L.* (*N.*) *americana* Banks, 1897	-	*L.* (*N.*) *antica* Navás, 1913
-	*L.* (*N.*) *amistadensis* Penny, 2001	-	*L.* (*N.*) *askanes* (Banks, 1946)
-	*L.* (*N.*) *antennalis* (Navás, 1932)	-	*L.* (*N.*) *azevedoi* Navás, 1913
-	*L.* (*N.*) *antica* Navás, 1913	-	*L.* (*N.*) *compar* (Navás, 1921)
-	*L.* (*N.*) *askanes* (Banks, 1946)	-	*L.* (*N.*) *cornesta* (Banks, 1944)
-	*L.* (*N.*) *azevedoi* Navás, 1913	-	*L.* (*N.*) *cortesi* Navás, 1913
-	*L.* (*N.*) *callota* Banks, 1915	-	*L.* (*N.*) *egregia* Navás, 1913
-	*L.* (*N.*) *camposi* (Navás, 1933)	-	*L.* (*N.*) *explorata* (Hagen, 1861)
-	*L.* (*N.*) *caucella* Banks, 1910	-	*L.* (*N.*) *forcipata* Penny, 1998
-	*L.* (*N.*) *centralis* Navás, 1913	-	*L.* (*N.*) *indiga* (Navás, 1928)
-	*L.* (*N.*) *championi* Navás, 1914	-	*L.* (*N.*) *laertes* (Banks, 1946)
-	*L.* (*N.*) *clepsydra* Banks, 1918	-	*L.* (*N.*) *lafoni* (Navás, 1911)
-	*L.* (*N.*) *clystera* Banks, 1918	-	*L.* (*N.*) *lancala lancala* (Banks, 1944)
-	*L.* (*N.*) *compar* (Navás, 1921)	-	*L.* (*N.*) *lenora* (Banks, 1944)
-	*L.* (*N.*) *cornesta* (Banks, 1944)	-	*L.* (*N.*) *nativa* (Navás, 1911)
-	*L.* (*N.*) *cortesi* Navás, 1913	-	*L.* (*N.*) *navasi* (Kimmins, 1940)
-	*L.* (*N.*) *egregia* Navás, 1913	-	*L.* (*N.*) *nigrovaria* (Walker, 1853)
-	*L.* (*N.*) *eubule* (Banks, 1944)	-	*L.* (*N.*) *pallescens* (Banks, 1946)
-	*L.* (*N.*) *explorata* (Hagen, 1861)	-	*L.* (*N.*) *postica* Navás, 1913
-	*L.* (*N.*) *floridana* Banks, 1897	-	*L.* (*N.*) *ratcliffei* Penny, 2001
-	*L.* (*N.*) *forcipata* Penny, 1998	-	*L.*(*N.*) *serrei* (Navás, 1924)

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Region	Species per region	Country	Species per country
-	*L.* (*N.*) *fuscinervis* Navás, 1914	-	*L.* (*N.*) *superior* Navás, 1913
-	*L.* (*N.*) *gloriosa* (Banks, 1910)	-	*L.* (*N.*) *virginiae* Penny, 1998
-	*L.* (*N.*) *gossei* (Kimmins, 1940)	EI Salvador	*L.* (*N.*) *amazonica* Navás, 1913
-	*L.* (*N.*) *indiga* (Navás, 1928)	Guatemala	*L.* (*N.*) *antica* Navás, 1913
-	*L.* (*N.*) *laertes* (Banks, 1946)	-	*L.* (*N.*) *askanes* (Banks, 1946)
-	*L.* (*N.*) *lafoni* (Navás, 1911)	-	*L.* (*N.*) *championi* Navás, 1914
-	*L.* (*N.*) *lancala lancala* (Banks, 1944)	-	*L.* (*N.*) *egregia* Navás, 1913
-	*L.* (*N.*) *lateralis* Navás, 1913	-	*L.* (*N.*) *fuscinervis* Navás, 1914
-	*L.* (*N.*) *lenora* (Banks, 1944)	-	*L.* (*N.*) *lateralis* Navás, 1913
-	*L.* (*N.*) *longistigma* (Navás, 1930)	-	*L.* (*N.*) *pallescens* (Banks, 1946)
-	*L.* (*N.*) *marginalis* Banks, 1915	-	*L.* (*N.*) *postica* Navás, 1913
-	*L.* (*N.*) *maronica* Navás, 1915	-	*L.* (*N.*) *punctata* Banks, 1903
-	*L.* (*N.*) *meteorica* Gerstaecker, 1894	-	*L.* (*N.*) *ramosa* (Navás, 1917)
-	*L.* (*N.*) *mexicana* Banks, 1900	-	*L.* (*N.*) *superior* Navás, 1913
-	*L.* (*N.*) *minima* Banks, 1918	-	*L.* (*N.*) *zapotina* Navás, 1913
-	*L.* (*N.*) *montanola* Banks, 1910	Honduras	*L.* (*N.*) *amazonica* Navás, 1913
-	*L.* (*N.*) *morenoi* (Navás, 1934)	-	*L.* (*N.*) *askanes* (Banks, 1946)
-	*L.* (*N.*) *morrisoni* (Navás, 1914)	-	*L.* (*N.*) *mexicana* Banks, 1900
-	*L.* (*N.*) *navasi* (Kimmins, 1940)	-	*L.* (*N.*) *navasi* (Kimmins, 1940)
-	*L.* (*N.*) *nativa* (Navás, 1911)	Mexico	*L.* (*N.*) *alloneura* (Banks, 1946)
-	*L.* (*N.*) *neuralis* Banks, 1910	-	*L.* (*N.*) *alternata* Navás, 1913
-	*L.* (*N.*) *nigrovaria* (Walker, 1853)	-	*L.* (*N.*) *americana* Banks, 1897
-	*L.* (*N.*) *orthones* (Banks, 1946)	-	*L.* (*N.*) *antennalis* (Navás, 1932)
-	*L.* (*N.*) *pacifica* (Navás, 1929)	-	*L.* (*N.*) *askanes* (Banks, 1946)
-	*L.* (*N.*) *pallescens* (Banks, 1946)	-	*L.* (*N.*) *callota* Banks, 1915
-	*L.* (*N.*) *panamana* (Banks, 1946)	-	*L.* (*N.*) *cortesi* Navás, 1913
-	*L.* (*N.*) *pavida* (Hagen, 1861)	-	*L.* (*N.*) *explorata* (Hagen, 1861)
-	*L.* (*N.*) *postica* Navás, 1913	-	*L.* (*N.*) *floridana* Banks, 1897
-	*L.* (*N.*) *punctata* Banks, 1903	-	*L.* (*N.*) *gossei* (Kimmins, 1940)
-	*L.* (*N.*) *ramosa* (Navás, 1917)	-	*L.* (*N.*) *mexicana* Banks, 1900

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Region	Species per region	Country	Species per country
-	*L.* (*N.*) *ratcliffei* Penny, 2001	-	*L.* (*N.*) *morrisoni* (Navás, 1914)
-	*L.* (*N.*) *salleana* (Navás, 1911)	-	*L.* (*N.*) *navasi* (Kimmins, 1940)
-	*L.* (*N.*) *serrei* (Navás, 1924)	-	*L.* (*N.*) *nigrovaria* (Walker, 1853)
-	*L.* (*N.*) *submacula* Banks, 1915	-	*L.* (*N.*) *pavida* (Hagen, 1861)
-	*L.* (*N.*) *sulcata* (Navás, 1921)	-	*L.* (*N.*) *punctata* Banks, 1903
-	*L.* (*N.*) *superior* Navás, 1913	-	*L.* (*N.*) *salleana* (Navás, 1911)
-	*L.* (*N.*) *virginiae* Penny, 1998	-	*L.* (*N.*) *sulcata* (Navás, 1921)
-	*L.* (*N.*) *zapotina* Navás, 1913	Nicaragua	*L.* (*N.*) *explorata* (Hagen, 1861)
-	-	Panama	*L.* (*N.*) *alloneura* (Banks, 1946)
-	-	-	*L.* (*N.*) *amazonica* Navás, 1913
-	-	-	*L.* (*N.*) *caucella* Banks, 1910
-	-	-	*L.* (*N.*) *centralis* Navás, 1913
-	-	-	*L.* (*N.*) *championi* Navás, 1914
-	-	-	*L.* (*N.*) *cortesi* Navás, 1913
-	-	-	*L.* (*N.*) *egregia* Navás, 1913
-	-	-	*L.* (*N.*) *laertes* (Banks, 1946)
-	-	-	*L.* (*N.*) *lancala lancala* (Banks, 1944)
-	-	-	*L.* (*N.*) *maronica* Navás, 1915
-	-	-	*L.* (*N.*) *mexicana* Banks, 1900
-	-	-	*L.* (*N.*) *nigrovaria* (Walker, 1853)
-	-	-	*L.* (*N.*) *orthones* (Banks, 1946)
-	-	-	*L.* (*N.*) *panamana* (Banks, 1946)
-	-	-	*L.* (*N.*) *punctata* Banks, 1903
-	-	-	*L.* (*N.*) *ramosa* (Navás, 1917)
-	-	-	*L.* (*N.*) *serrei* (Navás, 1924)
-	-	United States	*L.* (*N.*) *americana* Banks, 1897
-	-	-	*L.* (*N.*) *callota* Banks, 1915
-	-	-	*L.* (*N.*) *explorata* (Hagen, 1861)
-	-	-	*L.* (*N.*) *floridana* Banks, 1897
-	-	-	*L.* (*N.*) *pavida* (Hagen, 1861)
South America	*L.* (*N.*) *affinis* de Freitas & Penny, 2001	Bolivia	*L.* (*N.*) *egregia* Navás, 1913
-	*L.* (*N.*) *aleura* (Banks, 1944)	-	*L.* (*N.*) *marginalis* Banks, 1915

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Region	Species per region	Country	Species per country
-	*L.* (*N.*) *amazonica* Navás, 1913	-	*L.* (*N.*) *meteorica* Gerstaecker, 1894
-	*L.* (*N.*) *anae* de Freitas, 2007	Brazil	*L.* (*N.*) *affinis* de Freitas & Penny, 2001
-	*L.* (*N.*) *anchietai* (Navás, 1922)	-	*L.* (*N.*) *amazonica* Navás, 1913
-	*L.* (*N.*) *antennalis* (Navás, 1932)	-	*L.* (*N.*) *anae* de Freitas, 2007
-	*L.* (*N.*) *apicalis* Banks, 1915	-	*L.* (*N.*) *anchietai* (Navás, 1922)
-	*L.* (*N.*) *apicata* (Navás, 1926)	-	*L.* (*N.*) *apicata* (Navás, 1926)
-	*L.* (*N.*) *azevedoi* Navás, 1913	-	*L.* (*N.*) *azevedoi* Navás, 1913
-	*L.* (*N.*) *barrei* de Freitas & Penny, 2001	-	*L.* (*N.*) *barrei* de Freitas & Penny, 2001
-	*L.* (*N.*) *camposi* (Navás, 1933)	-	*L.* (*N.*) *camposi* (Navás, 1933)
-	*L.* (*N.*) *caucella* Banks, 1910	-	*L.* (*N.*) *cidae* de Freitas, 2007
-	*L.* (*N.*) *championi* Navás, 1914	-	*L.* (*N.*) *clepsydra* Banks, 1918
-	*L.* (*N.*) *cidae* de Freitas, 2007	-	*L.* (*N.*) *confusa* de Freitas & Penny, 2001
-	*L.* (*N.*) *clepsydra* Banks, 1918	-	*L.* (*N.*) *cornuta* de Freitas & Penny, 2001
-	*L.* (*N.*) *clystera* Banks, 1918	-	*L.* (*N.*) *cruentata* (Schneider, 1851)
-	*L.* (*N.*) *confusa* de Freitas & Penny, 2001	-	*L.* (*N.*) *deminuta* Lacroix, 1926
-	*L.* (*N.*) *cornesta* (Banks, 1944)	-	*L.* (*N.*) *diasi* (Navás, 1922)
-	*L.* (*N.*) *cornuta* de Freitas & Penny, 2001	-	*L.* (*N.*) *digitiformis* C. Tauber et al., 2008
-	*L.* (*N.*) *cortesi* Navás, 1913	-	*L.* (*N.*) *forciformis* de Freitas & Penny, 2001
-	*L.* (*N.*) *cruentata* (Schneider, 1851)	-	*L.* (*N.*) *furcata* de Freitas & Penny, 2001
-	*L.* (*N.*) *deminuta* Lacroix, 1926	-	*L.* (*N.*) *gemina* (Navás, 1929)
-	*L.* (*N.*) *diasi* (Navás, 1922)	-	*L.* (*N.*) *gossei* (Kimmins, 1940)
-	*L.* (*N.*) *digitiformis* C. Tauber et al., 2008	-	*L.* (*N.*) *guataparensis* de Freitas & Penny, 2001
-	*L.* (*N.*) *egregia* Navás, 1913	-	*L.* (*N.*) *heriocles* (Banks, 1944)
-	*L.* (*N.*) *eubule* (Banks, 1944)	-	*L.* (*N.*) *horni* (Navás, 1932)
-	*L.* (*N.*) *euterpe* (Banks, 1944)	-	*L.* (*N.*) *hybrida* (Rambur, 1842)
-	*L.* (*N.*) *forciformis* de Freitas & Penny, 2001	-	*L.* (*N.*) *icterica* de Freitas & Penny, 2001
-	*L.* (*N.*) *furcata* de Freitas & Penny, 2001	-	*L.* (*N.*) *incognita* de Freitas & Penny, 2001

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Region	Species per region	Country	Species per country
-	*L.* (*N.*) *gemina* (Navás, 1929)	-	*L.* (*N.*) *interata* de Freitas & Penny, 2001
-	*L.* (*N.*) *gloriosa* (Banks, 1910)	-	*L.* (*N.*) *intermedia* (Schneider, 1851)
-	*L.* (*N.*) *gossei* (Kimmins, 1940)	-	*L.* (*N.*) *kotzbaueri* (Navás, 1926)
-	*L.* (*N.*) *grisoli* (Navás, 1912)	-	*L.* (*N.*) *lancala lancala* (Banks, 1944)
-	*L.* (*N.*) *guataparensis* de Freitas & Penny, 2001	-	*L.* (*N.*) *lateralis* Navás, 1913
-	*L.* (*N.*) *heriocles* (Banks, 1944)	-	*L.* (*N.*) *lenora* (Banks, 1944)
-	*L.* (*N.*) *horni* (Navás, 1932)	-	*L.* (*N.*) *lineata* de Freitas & Penny, 2001
-	*L.* (*N.*) *hybrida* (Rambur, 1842)	-	*L.* (*N.*) *maculosa* de Freitas & Penny, 2001
-	*L.* (*N.*) *icterica* de Freitas & Penny, 2001	-	*L.* (*N.*) *marginalis* Banks, 1915
-	*L.* (*N.*) *incognita* de Freitas & Penny, 2001	-	*L.* (*N.*) *marquezi* Navás, 1913
-	*L.* (*N.*) *inquinata* Gerstaecker, 1888	-	*L.* (*N.*) *melanocera* (Navás, 1916)
-	*L.* (*N.*) *interata* de Freitas & Penny, 2001	-	*L.* (*N.*) *michelini* de Freitas & Penny, 2001
-	*L.* (*N.*) *intermedia* (Schneider, 1851)	-	*L.* (*N.*) *mortoni* Lacroix, 1926
-	*L.* (*N.*) *kotzbaueri* (Navás, 1926)	-	*L.* (*N.*) *nictheroyana* (Navás, 1926)
-	*L.* (*N.*) *lancala lancala* (Banks, 1944)	-	*L.* (*N.*) *parallela* de Freitas & Penny, 2001
-	*L.* (*N.*) *lancala plenota* (Banks, 1944)	-	*L.* (*N.*) *platyptera* Gerstaecker, 1888
-	*L.* (*N.*) *lateralis* Navás, 1913	-	*L.* (*N.*) *ramosi* (Navás, 1916)
-	*L.* (*N.*) *lenora* (Banks, 1944)	-	*L.* (*N.*) *retusa* de Freitas & Penny, 2001
-	*L.* (*N.*) *lineata* de Freitas & Penny, 2001	-	*L. robusta* de Freitas & Penny, 2001
-	*L.* (*N.*) *longistigma* (Navás, 1930)	-	*L.* (*N.*) *rochana* (Navás, 1922)
-	*L.* (*N.*) *maculosa* de Freitas & Penny, 2001	-	*L.* (*N.*) *rodriguezi* Navás, 1913
-	*L.* (*N.*) *mainerina* (Navás, 1929)	-	*L.* (*N.*) *rufescens* (Navás, 1931)
-	*L.* (*N.*) *marginalis* Banks, 1915	-	*L.* (*N.*) *santini* de Freitas & Penny, 2001
-	*L.* (*N.*) *maronica* Navás, 1915	-	*L.* (*N.*) *scomparini* de Freitas & Penny, 2001
-	*L.* (*N.*) *marquezi* Navás, 1913	-	*L.* (*N.*) *scurra* Lacroix, 1926

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-	*L.* (*N.*) *melanocera* (Navás, 1916)	-	*L.* (*N.*) *senior* (Navás, 1935)
-	*L.* (*N.*) *meridana* (Navás, 1927)	-	*L.* (*N.*) *squamisetosa* de Freitas & Penny, 2001
-	*L.* (*N.*) *meteorica* Gerstaecker, 1894	-	*L.* (*N.*) *stichocera* Navás, 1908
-	*L.* (*N.*) *michelini* de Freitas & Penny, 2001	-	*L.* (*N.*) *stichocera* Navás, 1913
-	*L.* (*N.*) *minima* Banks, 1918	-	*L.* (*N.*) *tabacina* de Freitas & Penny, 2001
-	*L.* (*N.*) *montanola* Banks, 1910	-	*L.* (*N.*) *tenuis* de Freitas & Penny, 2001
-	*L.* (*N.*) *morenoi* (Navás, 1934)	-	*L.* (*N.*) *theodori* (Navás, 1932)
-	*L.* (*N.*) *mortoni* Lacroix, 1926	-	*L.* (*N.*) *theodorina* (Navás, 1935)
-	*L.* (*N.*) *neuralis* Banks, 1910	-	*L.* (*N.*) *urucumis* de Freitas, 2007
-	*L.* (*N.*) *nictheroyana* (Navás, 1926)	-	*L.* (*N.*) *vieirana* Navás, 1913
-	*L.* (*N.*) *nigrovaria* (Walker, 1853)	-	*L.* (*N.*) *vignisi* de Freitas & Penny, 2001
-	*L.* (*N.*) *pacifica* (Navás, 1929)	-	*L.* (*N.*) *vittata* de Freitas & Penny, 2001
-	*L.* (*N.*) *panamana* (Banks, 1946)	-	*L.* (*N.*) *ypirangana* (Navás, 1932)
-	*L.* (*N.*) *parallela* de Freitas & Penny, 2001	Colombia	*L.* (*N.*) *caucella* Banks, 1910
-	*L.* (*N.*) *paraquaria* (Navás, 1929)	-	*L.* (*N.*) *clepsydra* Banks, 1918
-	*L.* (*N.*) *platyptera* Gerstaecker, 1888	-	*L.* (*N.*) *clystera* Banks, 1918
-	*L.* (*N.*) *postica* Navás, 1913	-	*L.* (*N.*) *eubule* (Banks, 1944)
-	*L.* (*N.*) *radiosa* Gerstaecker, 1888	-	*L.* (*N.*) *gloriosa* (Banks, 1910)
-	*L.* (*N.*) *ramosi* (Navás, 1916)	-	*L.* (*N.*) *lancala lancala* (Banks, 1944)
-	*L.* (*N.*) *retusa* de Freitas & Penny, 2001	-	*L.* (*N.*) *marginalis* Banks, 1915
-	*L.* (*N.*) *robusta* de Freitas & Penny, 2001	-	*L.* (*N.*) *minima* Banks, 1918
-	*L.* (*N.*) *rochana* (Navás, 1922)	-	*L.* (*N.*) *montanola* Banks, 1910
-	*L.* (*N.*) *rodriguezi* Navás, 1913	-	*L.* (*N.*) *neuralis* Banks, 1910
-	*L.* (*N.*) *rufescens* (Navás, 1931)	-	*L.* (*N.*) *nigrovaria* (Walker, 1853)
-	*L.* (*N.*) *santini* de Freitas & Penny, 2001	-	*L.* (*N.*) *panamana* (Banks, 1946)

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Region	Species per region	Country	Species per country
-	*L.* (*N.*) *scomparini* de Freitas & Penny, 2001	-	*L.* (*N.*) *submacula* Banks, 1915
-	*L.* (*N.*) *scurra* Lacroix, 1926	Ecuador	*L.* (*N.*) *antennalis* (Navás, 1932)
-	*L.* (*N.*) *senior* (Navás, 1935)	-	*L.* (*N.*) *camposi* (Navás, 1933)
-	*L.* (*N.*) *squamisetosa* de Freitas & Penny, 2001	-	*L.* (*N.*) *longistigma* (Navás, 1930)
-	*L.* (*N.*) *stichocera* Navás, 1908	-	*L.* (*N.*) *morenoi* (Navás, 1934)
-	*L.* (*N.*) *stichocera* Navás, 1913	-	*L.* (*N.*) *pacifica* (Navás, 1929)
-	*L.* (*N.*) *submacula* Banks, 1915	French Guiana	*L.* (*N.*) *cornesta* (Banks, 1944)
-	*L.* (*N.*) *surinamensis* (Banks, 1944)	-	*L.* (*N.*) *cruentata* (Schneider, 1851)
-	*L.* (*N.*) *tabacina* de Freitas & Penny, 2001	-	*L.* (*N.*) *maronica* Navás, 1915
-	*L.* (*N.*) *tenuis* de Freitas & Penny, 2001	-	*L.* (*N.*) *postica* Navás, 1913
-	*L.* (*N.*) *theodori* (Navás, 1932)	Guyana	*L.* (*N.*) *amazonica* Navás, 1913
-	*L.* (*N.*) *theodorina* (Navás, 1935)	-	*L.* (*N.*) *heriocles* (Banks, 1944)
-	*L.* (*N.*) *urucumis* de Freitas, 2007	-	*L.* (*N.*) *maronica* Navás, 1915
-	*L.* (*N.*) *vieirana* Navás, 1913	-	*L.* (*N.*) *submacula* Banks, 1915
-	*L.* (*N.*) *vignisi* de Freitas & Penny, 2001	Paraguay	*L.* (*N.*) *marquezi* Navás, 1913
-	*L.* (*N.*) *vittata* de Freitas & Penny, 2001	-	*L.* (*N.*) *paraquaria* (Navás, 1929)
-	*L.* (*N.*) *ypirangana* (Navás, 1932)	-	*L.* (*N.*) *rodriguezi* Navás, 1913
-	-	Peru	*L.* (*N.*) *apicalis* Banks, 1915
-	-	-	*L.* (*N.*) *azevedoi* Navás, 1913
-	-	-	*L.* (*N.*) *inquinata* Gerstaecker, 1888
-	-	-	*L.* (*N.*) *mainerina* (Navás, 1929)
-	-	-	*L.* (*N.*) *postica* Navás, 1913
-	-	-	*L.* (*N.*) *radiosa* Gerstaecker, 1888
-	-	Suriname	*L.* (*N.*) *aleura* (Banks, 1944)
-	-	-	*L.* (*N.*) *cornesta* (Banks, 1944)
-	-	-	*L.* (*N.*) *cruentata* (Schneider, 1851)
-	-	-	*L.* (*N.*) *euterpe* (Banks, 1944)
-	-	-	*L.* (*N.*) *heriocles* (Banks, 1944)

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Region	Species per region	Country	Species per country
-	-	-	*L.* (*N.*) *lancala lancala* (Banks, 1944)
-	-	-	*L.* (*N.*) *lancala plenota* (Banks, 1944)
-	-	-	*L.* (*N.*) *lenora* (Banks, 1944)
-	-	-	*L.* (*N.*) *maronica* Navás, 1915
-	-	-	*L.* (*N.*) *panamana* (Banks, 1946)
-	-	-	*L.* (*N.*) *postica* Navás, 1913
-	-	-	*L.* (*N.*) *submacula* Banks, 1915
-	-	-	*L.* (*N.*) *surinamensis* (Banks, 1944)
-	-	Venezuela	*L.* (*N.*) *caucella* Banks, 1910
-	-	-	*L.* (*N.*) *championi* Navás, 1914
-	-	-	*L.* (*N.*) *cortesi* Navás, 1913
-	-	-	*L.* (*N.*) *cruentata* (Schneider, 1851)
-	-	-	*L.* (*N.*) *grisoli* (Navás, 1912)
-	-	-	*L.* (*N.*) *lancala lancala* (Banks, 1944)
-	-	-	*L.* (*N.*) *lenora* (Banks, 1944)
-	-	-	*L.* (*N.*) *maronica* Navás, 1915
-	-	-	*L.* (*N.*) *meridana* (Navás, 1927)
-	-	-	*L.* (*N.*) *neuralis* Banks, 1910
-	-	-	*L.* (*N.*) *nigrovaria* (Walker, 1853)

3.4. Distribution of Nodita species per country (Table 2)

The Caribbean has species recorded from Cayman Islands (one species), Cuba (13 species, the highest), Dominican Republic (three species) , Haiti (one species), Jamaica (two species), Trinidad and Tobago (one species) and United States Virgin Islands (one species), while other countries lack records. In North and Central Ameica, species records are known from Costa Rica (26 species, the highest), EI Salvador (one species), Guatemala (12 species), Honduras four species), Mexico (18 species), Nicaragua (one species), Panama (17 species) and United States (five species) except Belize, Bermuda, Canada, Greenland, and Saint Pierre and Miquelon. In South Ameica, ten countries have records of *Nodita* species: Bolivia (three species), Brazil (64 species, the highest), Colombia (13 species), Ecuador (five species), French Guiana (four species), Guyana (four species), Paraguay (three species), Peru (six species), Suriname (13 species) and venezuela (11 species). Other countries in South America do not have the record.

3.5. DNA sequences of Nodita species (Table 1)

Fourteen species have available DNA sequences on NCBI. These species include *N. texana* (= *L. americana*), *L. camposi*, *L. cruentata*, *L. forciformis*, *L. gossei*, *L. icterica*, *L. lancala Lancala*, *L. lineata*, *L. marquezi*, *L. michelini*, *L. postica*, *L. robusta*, *L. rodriquezi*, *L. santini*, and *L. scomparini*. Seventeen cytochrome oxidase subunit I genes (COI) sequences, sixteen 16S ribosomal genes

(16S rRNA) sequences, and four CPSase region of carbamoyl-phosphate synthetase-aspartate transcarbamoylase-dihydroorotase genes (CAD) are available for 13 species. For *L. postica*, three nuclear genes phophoenolpyruvate carboxykinase (PepCK), wingless (wg), sodium/potassium ATPase alpha subunit (ATPase) can be obtained.

4. Results

The 142 species is from 25 countries. South America has the highest diversity with records from various countries such as Brazil, Colombia, Suriname, and venezuela. North and Central Ameica has the highest diversity observed from Costa Rica, Guatemala, and Mexico. The Caribbean has the highest diversity, which reported from Cuba. Multiple other countries lack any distribution records of the subgenus and a large amount of species are known from their type localities, which may be caused by insufficient investigation.

Among the 142 species, two species with the same bioname "*Leucochrysa firmini*", are homonyms based on the Code of Zoological Nomenclature (Articles 23.1, 2, 4 and 52.1, 2, 3). Brooks and Barnard [2] confirmed the homonym, but not gave a new name to relace the name published in 1927b without any comments. I am not the first one to discover this point and therefore it is not reasonable for me to give a replacement name for *L. firmini* (Navás, 1927) herein. The similar case also occurs in the two species with the name "*Leucochrysa stichocera*" and the treatment of this case is similar to the case of "*L. firmini* without providing a replacement name. For the species *L. australis* described by Navás [31], a nomen nudum, does not belong to a vaid species, so it can not be included in this study. Oswald [3] provided a name "*L. panamana* (Banks, 1944)" in his checklist, which is a nomen nudum. The vaild name should be *L. panamana* (Banks, 1946) published by Banks [7] with detailed description based on Article 13.1 of the Code.

Study on phylogeny of this subgenus is lacking, because only a small part of DNA sequences are availble for a few species. Such poor molecular coverage for the subgenus may also skew and bias DNA sequence comparison results and cannot be applied for analysis on phylogenetic relationships of *Nodita* species. Thus, more addtional DNA sequences are needed for most species, which can bring convenience for mutiple gene analysis for researchers to understand relationships among the species.

5. Conclusion

The study shows some countries have the record of *Nodia* species, while various countries lack it. From that, it can be inferred more recorded once reported from other countries and/or new species will be discovered in the future. As for the avaible DNA sequences, the coverage for this subgenus is poor, which should be solved based on additional materials to fill in the phylogenetic field to prompt the further study of this subgenus.

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