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The genus *Doliops* Waterhouse, 1841 (Coleoptera: Cerambycidae: Lamiinae) in the fauna of the Philippines

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The article summarizes data about 73 species of the genus *Doliops* Waterhouse, 1841 known from the Philippine Archipelago, as well as information about the distribution of species in different islands of the Philippines.

Key words: Doliops, Lamiinae, Cerambycidae, fauna, distribution, biogeography, Philippines.

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INTRODUCTION

The genus *Doliops* Waterhouse, 1841 belongs to the tribe Apomecynini, subfamily Lamiinae and has been intensively studied in the recent years (Barševskis 2013, 2014, 2015, 2017a, 2017b, 2018, 2021, 2024; Barševskis & Jaeger 2014; Barševskis & Kairišs 2019; Barševskis & Cabras 2020; Barševskis et al. 2021; Cabras & Barševskis 2015; Cabras & Medina 2019; Yoshitake & Yamasako 2016, 2018a, 2018b; Vives 2005, 2009, 2011, 2012a, 2012b, 2013, 2014, 2015). All described taxa of *Doliops* from the Philippines are endemics with very narrow distribution ranges. Many of them are threatened and needs urgent protection. It is therefore very important to publish updates on faunistic data for these endangered species. This article summarizes published information on the distribution of the genus *Doliops* in the Philippine Archipelago, critically evaluating the information.

In recent years, several studies has also been carried out on the *Doliops / Pachyrrynchus* mimicry complex, which is unique to many species of these two genera distributed in the Philippine and Taiwanese archipelagos. In many cases, this mimicry complex also includes some other genera of weevils, for example some species of *Polycatus, Metapocyrtus*, etc.. Van Dam et al. (2024) presented a Batesian mimicry complex involving flightless, armored *Pachyrhynchus* weevils and their winged *Doliops* longhorn beetle mimics and reported about their coevolutionary patterns within the Philippine Archipelago. The authors conclude that biogeography

confounds the signal of cospeciation in Batesian mimicry.

It is possible that the species of the *Doliops / Pachyrrynchus* mimicry complex could be used as an umbrella species complex for the protection of the most diverse jungle areas, as is the case in Europe for example with hermit beetles (*Osmoderma* LePeletier & Serville 1828) (Coleoptera: Scarabaeidae) (Smolis et al. 2023), which is used as an umbrella species for the protection of specific habitats. Unfortunately, there are no studies on the ecology of these species in the jungles of the Philippines. This is one of the tasks that should be realized by scientists in the near future.

MATERIALS AND METHODS

In the present paper I followed the taxonomic nomenclature provided by Tavakilian & Chavillotte (2024).

The list of species of the genus *Doliops* and information about their distribution is compiled from scientific publications and compared with information in the Titan database (Tavakilian & Chavillotte 2024). For certain species, data about their distribution has been clarified, as a number of species new to science have been described in recent years, which have significantly changed the preconceptions about the distribution of certain previously known species. All this has been taken into account in the preparation of information on the distribution of species of the genus *Doliops* in the Philippines.

Abbreviations, used in Table 1:
Distribution - see in Table 2
Type deposited - in Table 3
E- endemic

RESULTS AND DISCUSSION

According to published data, the genus *Doliops* (Fig. 1 -5) is represented by 73 taxa in the Philippine Archipelago (Table 1). All taxa are endemic to the aforementioned archipelagos with very narrow distribution ranges. Only two species, *D. curculionoides* Waterhouse, 1841 and *D. geometricus* Waterhouse, 1842 were found on several islands. All other species are endemic to specific islands with very narrow ranges, which in nature are often specific mountain ranges or even specific mountain slopes. They are found in the crowns of tall trees. Since the species of this genus fly, it is rather problematic to pluck them from tree crowns. Most often, the species of this genus are found in the mountains, where they live together with the weevils of the genus *Pachyrhynchus*.

Fig. 1. *Doliops basilanus zamboanganus* Barševskis 2018 (holotype)

Fig. 2. *Doliops marifelipeae* Barševskis & Kairišs, 2019 (paratype)

Most species are currently known from Luzon Island (31 species) and Mindanao Island (29 species) (Table 2).
Apart from the two named islands, where the greatest diversity of species of the genus *Doliops* can be observed, one to four species have been found in twelve other islands of the Philippine archipelago (Table 2).
If we compare the collections of beetles, which have the largest collection of the genus *Doliops*, than at the present time one of the largest collections in the world, which has almost 4000 specimens of this genus, is at the Coleopterological Research Center of Daugavpils University, Ilgas, Latvia. Thirty-three species of the genus are deposited in (Table 3). The types of 15 taxa are deposited in the private collection of Eduard Vives (Barcelona, Spain), and types of 10 taxa are deposited in Senckenberg Natural History collections (Dresden, Germany). The types of other taxa are deposited in another eight collections.

Fig. 3. *Doliops racsi* Barševskis & Kairišs, 2019 (paratype)

If we compare the contribution of scientists to the study of the genus *Doliops*, than the author of this article, A. Barševskis (Latvia) described 33 taxa, one species of which was synonymized. Eduard Vives has described 15 species of *Doliops*. Other authors have described from one to five species.

It is important to analyze the research intensity of the genus *Doliops* in different years (Table 5). Since the description of the

genus *Doliops* and the first species (Waterhause 1841) and the description of the second species a year later, not more new species of this genus were described during the entire XIX century. In the first half of the XX century, various authors discovered and described 18 taxa of this genus. Over the next fifty years, only one species was described. But this century saw the beginning of intensive studies of Philippine long-horned beetles, including the genus *Doliops*, and 54 new taxa have been described during twenty-four years. It can be predicted that the discovery of new species in this genus will continue and the list of species of the Philippine fauna will be expanded.

Fig. 4. *Doliops legalovi* Barševskis & Kairišs, 2019 (holotype)

Fig. 5. *Doliops du* Barševskis 2021

Table 1. Check-list of species of the genus *Doliops* in the fauna of the Philippines

	Taxa	Distribution	Type deposited	Endemic
1.	*Doliops ageometricus* Barševskis, 2014	Min	DUBC	E
2.	*Doliops anichtchenkoi* Barševskis, 2013	Luz	DUBC	E
3.	*Doliops animulus* Kriesche, 1940	Luz	ZMHB	E
4.	*Doliops bakeri* Heller, 1924	Neg	SNSD	E
5.	*Doliops balalaikinsi* Barševskis, 2014	Luz	DUBC	E
6.	*Doliops barsevskisi* Cabras & Medina, 2020	Min	UMCRC	E
7.	*Doliops basilanus basilanus* Heller, 1923	Bas	SNSD	E
8.	*Doliops basilanus zamboanganus* Barševskis, 2018	Min	DUBC	E
9.	*Doliops belenae* Yoshitake & Yamasako, 2018	Luz	NIAES	E
10.	*Doliops bitriangularis* Breuning, 1947	Luz	NHRS	E
11.	*Doliops boholensis boholensis* Yoshitake & Yamasako, 2016	Boh	NIAES	E
12.	*Doliops boholensis sakaii* Yoshitake & Yamasako, 2018	Ley	NIAES	E
13.	*Doliops boteroi* Barševskis, 2017	Min	DUBC	E
14.	*Doliops bukidnoni* Vives, 2014	Min	EVC	E
15.	*Doliops cabrasae* Barševskis, 2017	Min	DUBC	E
16.	*Doliops confluens* Kriesche, 1928	Buc	ZMHB	E
17.	*Doliops coriticoi* Cabras & Barševskis, 2016	Min	UMCRC	E
18.	*Doliops costatus* Vives, 2012	Min	EVC	E
19.	*Doliops cuellari* Vives, 2012	Min	EVC	E
20.	*Doliops curculionoides* Waterhouse, 1841	Buc Luz Mas Min Sam Sur	NHM	E
21.	*Doliops daugavpilsi* Barševskis, 2014	Min	DUBC	E
22.	*Doliops du* Barševskis, 2021	Min	DUBC	E
23.	*Doliops dunskisi* Barševskis, 2017	Min	DUBC	E
24.	*Doliops duodecimpunctatus* Heller, 1923 **Syn:** *D. gutowskii* Barševskis, 2013	Min	SNSD DUBC	E
25.	*Doliops dupaxi* Vives, 2013	Luz	EVC	E
26.	*Doliops edithae* Vives, 2009	Min	EVC	E
27.	*Doliops elcanoi* Vives, 2011	Luz	EVC	E
28.	*Doliops emmanueli* Vives, 2009	Luz	EVC	E
29.	*Doliops frosti* Schultze, 1923	Sam	SNSD	E
30.	*Doliops geometricus* Waterhouse, 1842 **Syn:** *D. geometrica conjuncta* Kriesche, 1928	Buc Ley Min Sam Sia	NHM ZMHB	E

31. *Doliops gertrudis* Hüdepohl, 1990	Neg	ZSBS	E
32. *Doliops halconensis* Vives, 2012	Mnd	EVC	E
33. *Doliops havai* Barševskis, 2018	Luz	DUBC	E
34. *Doliops helleri* Vives, 2009	Luz	EVC	E
35. *Doliops huruki* Barševskis, 2014	Min	DUBC	E
36. *Doliops imitator* Schultze, 1918	Luz	SNSD	E
37. *Doliops imomzodai* Barševskis, 2017	Min	DUBC	E
38. *Doliops isabelae* Vives, 2014	Luz	EVC	E
39. *Doliops ismaeli* Vives, 2005	Bab	EVC	E
40. *Doliops jirouxi* Barševskis, 2014	Luz	DUBC	E
41. *Doliops johnvictori* Vives, 2009	Luz	EVC	E
42. *Doliops kaorui* Yoshitake & Yamasako, 2018	Pan	NIAES	E
43. *Doliops kaupersi* Barševskis, 2024	Min	DUBC	
44. *Doliops kivlenieceae* Barševskis, 2014	Min	DUBC	E
45. *Doliops legalovi* Barševskis & Kairiss, 2019	Min	DUBC	E
46. *Doliops ligatus* Schwarzer, 1929	Luz	SMF	E
47. *Doliops marifelipeae* Barševskis & Kairišs, 2019	Luz	DUBC	E
48. *Doliops metallicus* Breuning, 1938	Luz	SNSD	E
49. *Doliops mindoroensis* Barševskis, 2017	Mnd	DUBC	E
50. *Doliops multifasciatus* Schultze, 1922	Min	SNSD	E
51. *Doliops octomaculatus* Breuning, 1938	Luz	NHMB	E
52. *Doliops pachyrrhynchoides* Heller, 1917	Luz	SNSD	E
53. *Doliops pinedai* Vives, 2012	Luz	EVC	E
54. *Doliops racsi* Barševskis & Kairiss, 2019	Luz	DUBC	E
55. *Doliops rukmaneae* Barševskis, 2017	Min	DUBC	E
56. *Doliops santossilvai* Barševskis, 2017	Min	DUBC	E
57. *Doliops savenkovi* Barševskis, 2013	Luz	DUBC	E
58. *Doliops schultzei* Barševskis & Jäger, 2014	Pol	DUBC	E
59. *Doliops serapavginae* Barševskis, 2014	Min	DUBC	E
60. *Doliops shavrini* Barševskis, 2013	Luz	DUBC	E
61. *Doliops siargaoensis* Schultze, 1919	Sia	SNSD	E
62. *Doliops sklodowskii* Barševskis, 2013	Luz	DUBC	E
63. *Doliops stradinsi* Barševskis, 2013	Luz	DUBC	E
64. *Doliops tamutisi* Barševskis, 2014	Min	DUBC	E
65. *Doliops taylori* Vives, 2013	Luz	EVC	E
66. *Doliops transverselineatus* Breuning, 1947	Luz	NHRS	E
67. *Doliops um* Barševskis, 2019	Min	DUBC	E
68. *Doliops urdanetai* Vives, 2011	Luz	EVC	E

69. *Doliops valainisi* Barševskis, 2013	Min	DUBC	E
70. *Doliops villalobosi* Heller, 1926	Sam	SNSD	E
71. *Doliops viridisignatus* Breuning, 1947	Luz	NHRS	E
72. *Doliops vivesi* Barševskis, 2013	Luz	DUBC	E
73. *Doliops ziedonisi* Barševskis, 2017	Min	DUBC	E

Table 2. Abbreviations, full names and number of taxa in different islands of the Philippine Archipelago

Island	Number of taxa
Bab - Babuyan	1
Bas - Basilan	1
Boh - Bohol	1
Buc - Bucas	3
Ley - Leyte	2
Luz - Luzon	31
Mas - Masbate	1
Min - Mindanao	29
Mnd - Mindoro	2
Neg - Negros	2
Pan - Panay	1
Pol - Polilo	1
Sam - Samar	4
Sia - Siargao	2

Table 3. Abbreviations and full name of collections and umber of taxa which type / types deposited

Collection	Number of taxa which type / types deposited
DUBC - Daugavpils University Beetles Collection, Ilgas, Latvia	33
EVC - Eduard Vives Private Collection - Barcelona, Spain	15
SNSD - Senckenberg Natural History collections, Dresden, Germany	10
ZMHB - Museum für Naturkunde, Berlin, Germany	3
NIAES - Laboratory of Insect Systematics, Institute of Agroenvironmental Sciences, Tsukuba, Japan	4
NHRS - Naturhistoriska Riksmuseet, Stockholm, Sweden	3
UMCRC - University of Mindanao, Coleoptera Research Centre, Davao, Philippines	2
NHMB - Naturhistorisches Museum Basel, Switzerland	1
SMF - Natur Museum und Forschungs Institute Senkenberg, Frankfurt am Main, Germany	1
NHM - The Natural History Museum, London, UK	2
ZSBS - Zoologische Staatssammlung des Bayrischen Staates, Munich, Germany	1

Table 4. Number of *Doliops* taxa described by authors

Authors	Number of taxa
Barševskis	33 (1)
Vives	15
Heller	5
Breuning	5
Schultze	4
Yoshitake	4
Yamasako	4
Kriesche	3(1)
Kairišs	3
Cabras	2
Waterhause	2
Aurivillius	1
Medina	1
Hüdepohl	1
Jaeger	1

Table 5. Research intensity of the genus *Doliops* in different years

Period	Number of described taxa
1841 - 1899	2
1900 - 1949	18
1950 - 1999	1
2000 - 2024	54

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