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SHORT COMMUNICATION

Platyscelio hits again: the first record of this genus in the Dominican Republic

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Abstract

After the presence of the genus *Platyscelio* was noticed and confirmed in the Neotropical realm, in this paper the genus is recorded from the Panamanian realm, in Dominican Republic. In the Neotropical realm *Platyscelio* is represented through *P. africanus* Risbec, previously considered as being present only in the Afrotropical realm, but in the Panamanian realm we found a different species – *P. pulchricornis* Kieffer.

Keywords

Scelionidae, Panamanian, wasp, new record.

Some of the most stunning and strange species that belong to the parasitoid wasps of the family Scelionidae are grouped in the genus *Platyscelio*. Due to conspicuous traits, such as the strongly flattened body and of the obviously modified scape, especially in the case of the females, the species of this genus are relatively easily recognizable.

The type species of this genus – *Platyscelio pulchricornis* Kieffer, 1905 – was collected by the Italian naturalist Lamberto Loria from Papua New Guinea and donated to Museo Civico di Storia Naturale "Giacomo Doria". From the collection of this museum, this species was identified and described by JJ Kieffer in 1905 as the type species for his new genus *Platyscelio*.

In the original description (Kieffer 1905) it is emphasized how peculiar is the shape of female's antenna through a hand drawing. The uniqueness of the antenna

and its uncommon structure is reflected in the etymology of the specific name *pulcher* – beautiful; *cornus* – horn, *sensu* antenna. Other important characteristics of this genus were noticed by Brues in 1922, when he published a very accurate drawing of the habitus of a male specimen of *Platyscelio* from Fiji. This drawing, according to the author, is attributed to Brues' wife (Brues 1922). Although it is difficult to be completely sure, the drawing of *Platyscelio* published by Brues very probably represents the male of *P. pulchricornis*. We can assert this because in the drawing the posterior scutellar sulcus is medially interrupted, which is one of the main characters used for the identification of this species. This assumption is also supported by the collecting locality (inside the area of distribution of *P. pulchricornis*), and by the fact that even Brues (1922) considers his specimen as closely related to *P. punctatus* Kieffer, a species later regarded by Taekul et al. (2010) as a junior synonym of *P. pulchricornis*.

Taekul et al. (2010) list six known species of *Platyscelio*, four of which are relatively restricted geographically (*P. arcuatus* Taekul and Johnson and *P. striga* Taekul and Johnson were identified from Western Australia, *P. mzantsi* Taekul and Johnson from South Africa, and *P. mysterium* Taekul and Johnson from Zimbabwe, Botswana and South Africa) and two have a large geographical distribution (*P. africanus* Risbec was found in Benin, Cameroon, Central African Republic, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Mozambique, Nigeria, Sierra Leone, South Africa, Tanzania, Togo, Uganda, Yemen, Zimbabwe, and *P. pulchricornis* was identified from Australia, Bangladesh, China, India, Indonesia, Japan, Malaysia, Papua New Guinea, Philippines, Solomon Islands, Taiwan, Thailand, Vanuatu and Vietnam).

Popovici et al. (2018) and Talamas and Popovici (2021) bring new data on the distribution area of *P. africanus* with a new record of this species from two countries in the Neotropical region (French Guiana and Republic of Surinami). The data concerning the distribution of *P. pulchricornis* presented in Taekul et al. (2010) are then updated by Johnson et al. (2013) and Komeda (2021), the later author also presenting new information concerning the preferred habitat of the species.

In close connection with the large area of distribution, *P. pulchricornis* displays phenotypic variability. The species concept of classical authors concerning *P. pulchricornis* was narrower than the actual concept, leading to multiple descriptions by different authors under different names. At the beginning of the 20th century, James Chamberlain Crawford described it as *P. abnormis* from Manila (Philippine) (Crawford 1910). Three years later the species was described three times as *P. mirabilis* from Nelson, near Cairns, Queensland (Australia) by Dodd (1913), as *P. wilcoxi* from Guam (USA) by Fullaway (1913), and as *P. punctatus* from Los Baños (Philippine) by Kieffer (1913). More recently, the same species is described once more as *P. dunensis* by Mukerjee (1993).

The differences between these species concepts consist in the color of the tip of metasoma, color of the antenna, sculpture of mesoscutum and of metasoma. Over the time, some authors considered the value of these characters in species delimitation to be debatable. So, Yasumatsu (1941) considers *P. wilcoxi* Fullaway as junior synonym of *P. abnormis* Crawford and Galloway. Austin (1984) raised the question of synonymy

between the *P. mirabilis* Dodd and *P. pulchricornis* Kieffer, however without formally synonymizing these two. Taekul et al. (2010) considered that these species were separated by characters which merely reflect the intraspecific variability and regarded all of them as junior synonyms of *P. pulchricornis*.

Platyscelio pulchricornis was identified so far in four out of the eleven zoogeographical realms as defined by Holt et al. (2013): Australian, Oceanian, Oriental and Sino-Japanese. In the present study we found a male of this species (Fig. 1A–C) in the Dominican Republic (Fig. 2A, B), adding Panamanian to the list. The specimen presented here was collected by the second author using an entomological net, in January 2022 from the Hispaniola Island in the Caribbean, also known as Española from Greater Antilles. The exact locality is Bavaro area (18.687326ºN, 68.428893ºW, altitude 3 m), 1 km of the seaside of the North Atlantic Ocean and 15 km northwest of Punta Cana. Now, it is stored in the Ovidiu Popovici personal collection (OPPC). The habitat consists of bushes and trees, the collecting area being close to roads, local houses and touristic resorts (Fig. 2A, C).

The Dominican Republic is considered part of the North American continent, with the Atlantic Ocean border in the North and the Caribbean Sea in the South. The Bavaro area is included in the Hispaniolan moist forest ecoregion with a tropical rainforest climate, with 1.000 to 1.300 mm of annual rainfall, the rainy season lasting from April to December. The annual average temperature is 28–31ºC in the Bavaro area which is close to the coast and even with a Monsoon influence, the climatic classification being dry subhumid (Izzo et al. 2010). The soil is calcareous, and the forests cover plateaus, valleys and slopes. Over 12% of the territory of the Dominican Republic is a protected area, with 14 national parks and 9 natural reserves. The Flora of the Dominican Republic includes more than 6.000 species of plants of which more than 2.000 are endemic (over 35%) and similarly, there are many animal species endemic to this country.

The oldest rocks on the Hispanola Island was formed in the early Cretaceous, the Greater Antilles being old fragments of continental crust formed as islands to the East of the actual Isthmus of Panama (Ricklefs and Bermingham 2008). It's possible that the Hispanola remained above water in Paleocene, but for sure in Eocene, in a period with an extensive inundation (Liebherr 1988; Ricklefs and Bermingham 2008). The Hispaniolan fauna has strong affinities with the fauna of Cuba, also with the fauna of Puerto Rico and with Jamaica, the last one being completely submerged in the Miocene (Botosaneanu 1996; Liebherr 1988). Perhaps there was a time when land bridges connected Yucatán, Cuba and Hispanola and Jamaica to Hispanola (Liebherr 1988). The West Indies are not so isolated as Galapagos, with a big number of endemic species. The fauna of West Indies was formed as an interaction between continental and island faunas. Part of the fauna has continental origin, but other species originated by over water colonization and occasionally some species can undergo speciation (Ricklefs and Bermingham 2008). For instance, from 383 species of ants, 176 (46%) are endemic to the West Indies (Wilson 1988).

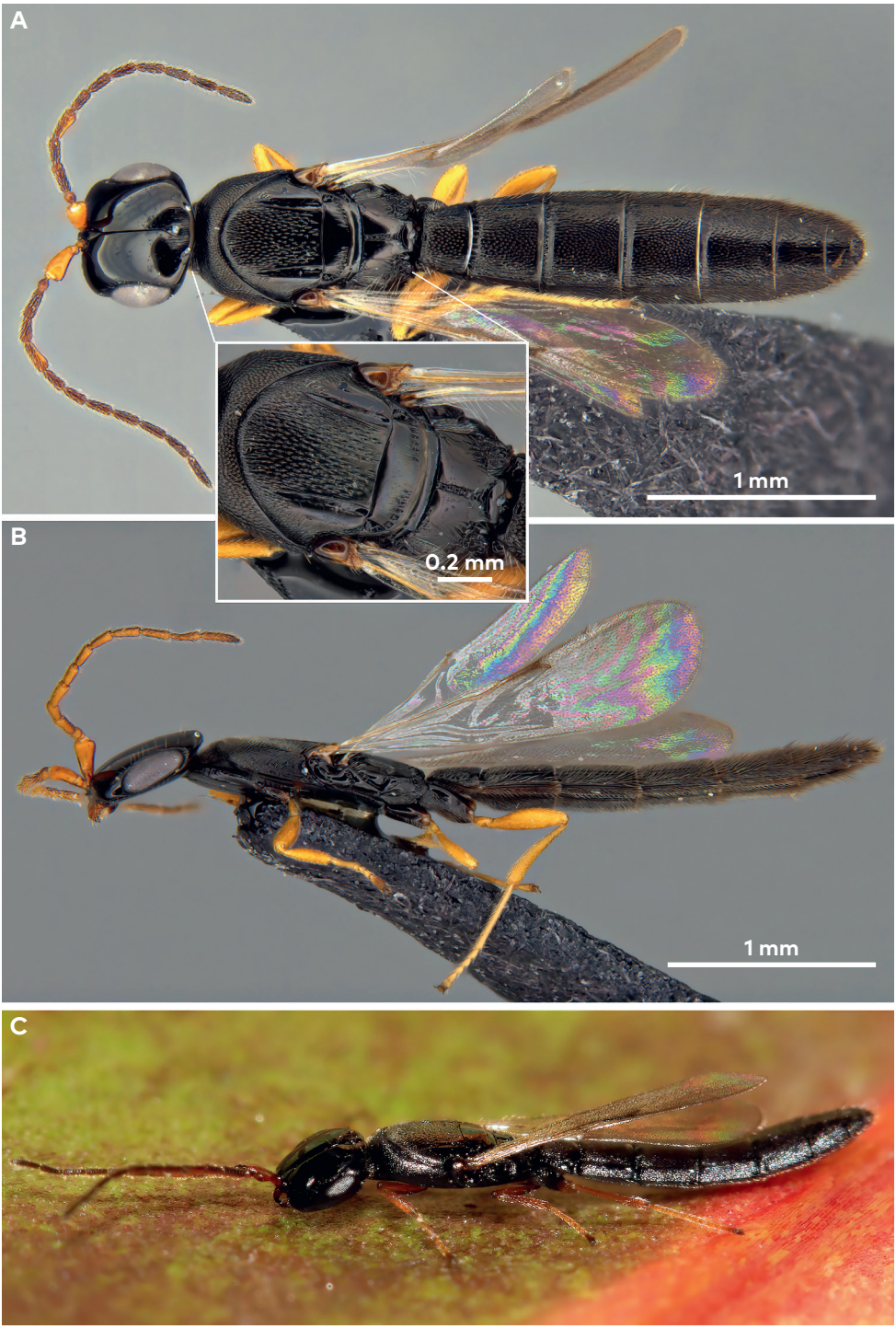

Figure 1. *Platyscelio pulchricornis*: **A** habitus, dorsal view; **B** habitus, lateral view; **C** habitus, *in situ*.

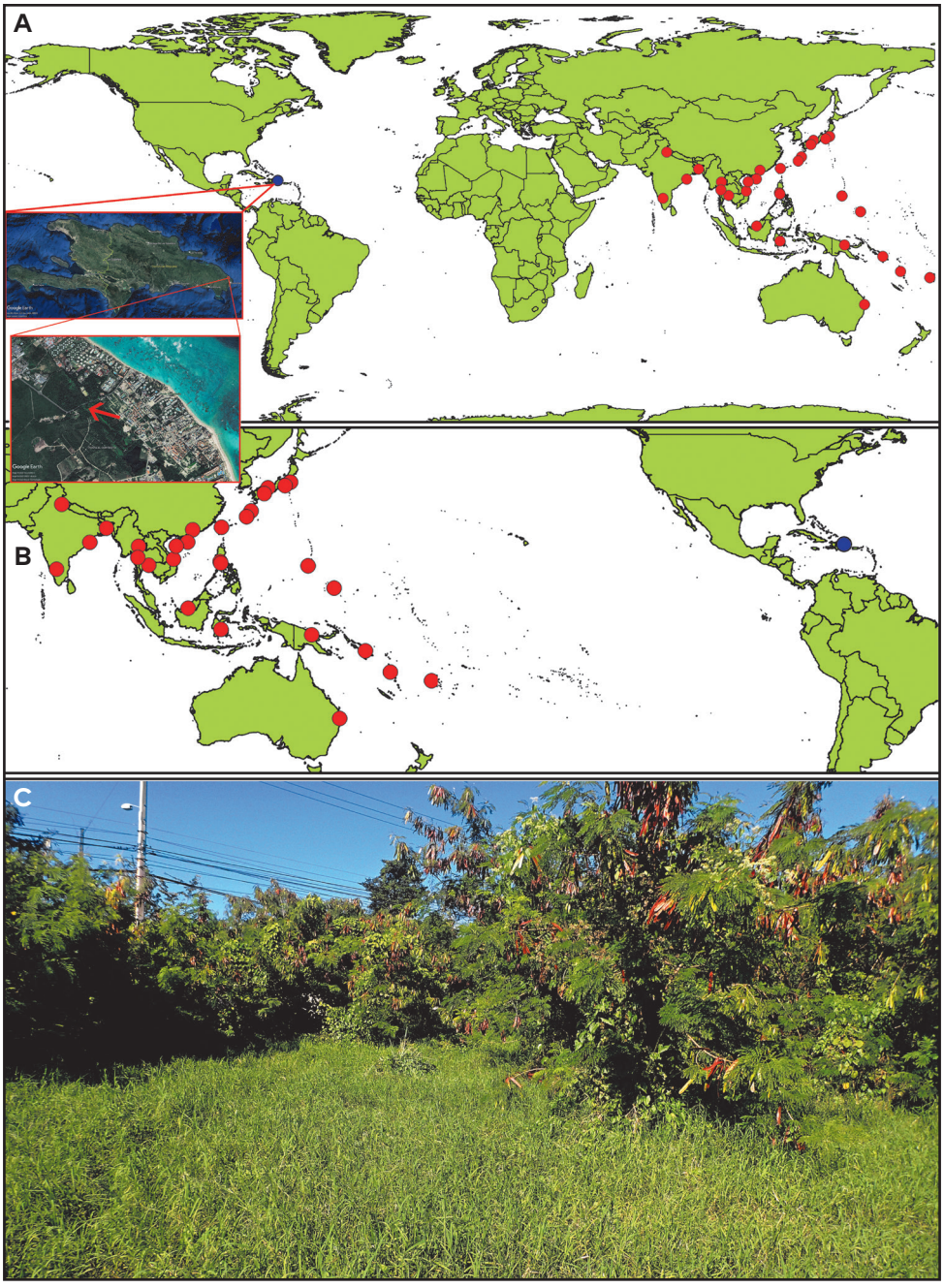

Figure 2. *Platyscelio pulchricornis*: **A** world distribution; **B** detail of distribution; **C** characteristic habitat (red dots – previously known data; blue dot – our new record).

It's hard to trace the origin of *P. pulchricornis* in the Dominican Republic because there is an enormous water gap between this new record and the previously known distribution of this species. Maybe further studies will clarify the origin of these distinctively separated distribution areas and maybe other populations will be found between these known areas. Rosen (1975) described an Eastern Atlantic (West African) Caribbean track for the distribution of some taxa, with examples between Gulf of Guinea and the northeastern part of South America, being known the historical affinities of the tropical Africa with the northeastern part of South America. It's interesting that he presents the world distribution of the fishes of the genus *Ophisternon* (Synbranchidae) that includes three isolated centers: South and Southeast Asia, New Guinea, Australia, West Africa and Middle America. If we look at the distribution of *P. pulchricornis*, it has a similar pattern of distribution except for Africa. In contrast, *P. africanus* has many records from Africa, but it was recently also identified from South America (Popovici et al. 2018; Talamas and Popovici 2021).

Concerning the presence of *P. pulchricornis* in the Dominican Republic we resume to two scenarios. The first is that *P. pulchricornis* has a larger distribution than we previously accepted and the second is that it was introduced naturally or as the result of the anthropic activities. The Dominican Republic is the most visited destination in the Caribbean, being the largest economy in the Caribbean and the Central American region and the seventh largest economy in the Latin America with the fastest growing economy in the Western Hemisphere (UNWTO 2018). In this case we can presume that the trade routes can be a way for the introduction of new species in the country, especially a species with specimens that are so reduced in size. There are other examples of introduced species of hymenopterans by human mediated transportation, frequently with the transportation of their hosts (Fusu 2017; Polaszek et al. 2022; Rasplus et al. 2010). Also, Popovici et al. (2018) formulated some hypotheses concerning the modality of introducing microhymenopteran species to a wide geographical area based on examples from Platygastroidea.

Our finding is another example that strengthens our collective argument that we should not diminish collecting efforts, but rather try to cover every possible spot on Earth. The destruction of the habitats eliminates from nature the species even before we can record their existence and millions of years of natural evolution are sentenced to oblivion, making it so much harder to understand the diversity of life on Earth.

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References

Botosaneanu L (1996) Caddis Flies (Trichoptera) from the Dominican Republic (West Indies). II. All families except Hydroptilidae; with general observations for Hispanola. Bulletin de L'Institut Royal des Sciences Naturelles de Belgique. Entomologie 66: 5–26.

Fusu L (2017) An integrative taxonomic study of European *Eupelmus* (*Macroneura*) (Hymenoptera: Chalcidoidea: Eupelmidae), with a molecular and cytogenetic analysis of *Eupelmus* (*Macroneura*) *vesicularis*: several species hiding under one name for 240 years. Zoological Journal of the Linnean Society 20: 1–85. https://doi.org/10.1093/zoolinnean/zlw021

Galloway ID, Austin AD (1984) Revision of the Scelioninae (Hymenoptera: Scelionidae) in Australia. Australian Journal of Zoology Supplementary Series 99: 1–138.

Holt BG, Lessard J-P, Borregaard MK, Fritz SA, Araújo MB, Dimitrov D, Fabre PH, Graham CH, Graves GR, Jønsson KA, Nogués-Bravo D, Wang Z, Whittaker RJ, Fjeldså J, Rahbek C (2013) An Update of Wallace's Zoogeographic Regions of the World. Science 339: 74–78.

Izzo M, Aucelli P, Maratea A, Rosskopf C, Mendez TR, Pérez C, Segura H (2010) A New Climatic Map of the Dominican Republic Based on the Thornthwaite Classification. Physical Geography 31(5): 455–472.

Johnson N, Burks R, Austin A, Zaifu X (2013) Chinese species of egg-parasitoids of the genera *Oxyscelio* Kieffer, *Heptascelio* Kieffer and *Platyscelio* Kieffer (Hymenoptera: Platygastridae s.l., Scelioninae). Biodiversity Data Journal 1: e987. doi: 10.3897/BDJ.1.e987

Kieffer JJ (1905) Nouveaux Proctotrypides exotiques conservés au Musée Civique de Gênes et décrits par le dr. J.J. Kieffer, Professeur à Bitche. Annali del Museo Civico di Storia Naturale Giacomo Doria (Genova) 2(2): 9–39. [in French]

Komeda Y (2021) Records of the flat egg parasitoid wasp, *Platyscelio pulchricornis* Kieffer, 1905 (Insecta: Hymenoptera: Scelionidae), from Japan, with some reports on its habitat. Fauna Ryukyuana 62: 1–4.

Liebherr JK (1988) The Caribbean: Fertile Ground for Zoogeography. In: Liebherr JK (Ed.) Zoogeography of Caribbean insects. Cornell University Press, Ithaca, N.Y., 1–14.

Mukerjee MK (1993) On a collection of Scelionidae (Proctotrupoidea: Hymenoptera) from Garhwal Himalayas, India. Hexapoda 5: 75–105.

Rasplus J-Y, Villemant C, Paiva MR, Delvare G, Roques A (2010) Hymenoptera. Chapter 12. In: Roques A et al. (Eds) Arthropod invasions in Europe. BioRisk 4(2): 669–776. doi: 10.3897/biorisk.4.55

QGIS Development Team (2021) QGIS Geographic Information System. Open Source Geospatial Foundation Project. http://qgis.osgeo.org

Polaszek A, Fusu L, Viggiani G, Hall A, Hanson P, Polilov AA (2022) Revision of the World Species of *Megaphragma* Timberlake (Hymenoptera: Trichogrammatidae). Insects 13(6): 561. https://doi.org/10.3390/insects13060561

Popovici OA, Masner L, Viciriuc M, Pintilioaie A, Notton DG, Talamas E (2018) New distribution data for some charismatic tramp species of Platygastroidea (Hymenoptera). Zootaxa 4370(1): 1–22. doi: 10.11646/zootaxa.4370.1.1.

Ricklefs R, Bermingham E (2008) The West Indies as laboratory of biogeography and evolution. Philosophical Transactions of the Royal Society 363: 2393–2413. doi:10.1098/rstb.2007.2068

Rosen DE (1975) A vicariance model of Caribbean biogeography. Systematic Zoology 24(4): 431–464.

Taekul C, Johnson NF, Masner L, Polaszek A, Rajmohana K (2010) World species of the genus *Platyscelio* Kieffer (Hymenoptera: Platygastridae). ZooKeys 50: 97–126. ISSN: 1313-2970 (online) ISSN: 1313-2989 (print) DOI: 10.3897/zookeys.50.485

Talamas E, Popovici OA (2021) The second record of *Platyscelio* (Hymenoptera: Scelionidae) in South America. Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 64(2): 93–96. https://doi.org/10.3897/travaux.64.e76076

World Tourism Organization (2018) UNWTO Tourism Highlights, 2018 Edition, UNWTO, Madrid, 1–19. doi: https://doi.org/10.18111/9789284419876

Wilson EO (1988) The Biogeography of the West Indian Ants (Hymenoptera: Formicidae). In: Liebherr JK (Ed.) Zoogeography of Caribbean insects. Cornell University Press, Ithaca, N.Y., 214–230.

Yasumatsu K (1941) Two interesting Scelionidae from Micronesia with biological notes by Prof. T. Esaki. Transactions of the Natural History Society of Formosa 31: 76–82.